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Abstract

This dissertation address questions that lie at the intersection of ‘entrepreneurship’ and ‘strategic human capital’ streams of literature. In chapter 1 or the introduction chapter, I provide a brief overview of structure of the dissertation. In chapter 2, I introduce the data context, which is Indian internet start-ups and I further discuss data collection process in detail. I use this single data context for all the other three chapters of dissertation.

In first study or chapter 3, the broader question I address is the factors that lead start-ups to further scale-up. Job creation is one of the economic outcomes of start-ups and hence I focus on scaling up in terms of employee growth. I ask if having an organizational structure early on helps start-ups to scale up and grow to be larger firms to create more jobs. In second study or chapter 4, I address the broad question of ‘who becomes a founder?’. Based on the timing of joining a start-up, employees get different kinds of exposure and hence different type of learning. In this study, I ask if early employees or those employees who join start-ups when the start-up in an early phase are more likely to be entrepreneurs compared to those employees who join start-ups at a later phase or when the start-up is in a more mature phase. In the third study of chapter 5, I explore entrepreneurial strategy of non-monetary incentives in the form of job titles. I look at correlation between higher job titles, experience of employees, timing of joining of employees and likelihood of their departure. I take a question based approach in order to address one of the hiring strategies of start-ups, which is giving better/higher job titles to its employees as opposed to higher pay.

For all the three studies, I use a unique data entirely constructed using publicly available data. Dataset is a linked employee-employee dataset of Indian internet-based start-ups to gain insights from a new industry and an emerging market context with large Information Technology labor market. In the final chapter 6, I conclude with future research directions.

CHAPTER 1. Introduction

Start-ups serve an economy as engines of innovation, employment generation and places for nurturing employee skills. A large amount of prior literature answered questions pertaining to start-ups contribution to innovation in an economy. In the current dissertation, I shall explore employment generation and employee nurturing aspects. Employment generation perspective underscores the importance of growth of startups to larger established firms. Experimental environment perspective can be viewed as contributing to career path of employees. Like the returns of entrepreneurship that founders gain, employees can also have returns to their startup experience. I consider both perspectives and conduct analyses at firm level and employee-level in different chapters.

For my dissertation, I setup a linked employee-employer dataset of consumer digital or internet-based startups in India. In contexts where traditional databases like census data or government records of employees are absent, publicly available online career profiles can be used to address data constraints and open new avenues for research in emerging market contexts. As an emerging economy ranking globally third for startup activity and with a large Information technology labor market, Indian context serves as an appropriate setting to uncover novel insights. With the increased use of micro-level employee register data from various contexts, the setting of my dissertation stands relevant and attempts to strike a conversation with strategic human capital and entrepreneurship streams of literature. I further discuss context and data in detail in next chapter 2.

Although, start-ups create new jobs as they hire individuals over time, high failure rates that lead to job loss in the long run. Focus of entrepreneurship policy has shifted from mere start-up creation to converting these start-ups to larger scaled-up firms. Scaling-up of start-ups is an important aspect as start-ups play a major role in job creation (Haltiwanger, Jarmin, and Miranda 2013). Although start-ups have high failure rates, conditional on survival, they exhibit higher average growth rates as compared to older firms (Ouimet and Zarutskie 2014).

With advent of new technologies, costs of setting up a firm decreased drastically. These firms do not have any large amounts of physical assets and human capital is their key asset. Adopting the broad conceptual framework of human capital (HC) provided by (Wright et. al., 2014), I look at HC both at an organizational level and individual level. At an organizational level, by looking at the evolution of human capital profiles of startups transitioning from early phases to growth phases, I intend to contribute to strategic human capital literature corresponding to phases where human resource (HR) strategy takes place outside of HR departments. At an employee level, I intend to contribute to the career perspective that suggests that employees build their career path and might be experimenting with their career while working in startup. In the following section, I briefly outline three chapters of the dissertation.

In first study or chapter 3, I focus upon organizational structure and ask if having an organizational structure early on helps start-ups to scale up and grow to be larger firms. Organizational structure and design can be perceived as either inhibitors or accelerators of organizational performance. Organizational structure induces rigidity owing to specific rules that are introduced. They could be simple rules but these lower the levels of flexibility in a firm. In the short-run this increases costs and poses a survival threat to the firm. Whereas in

the long-run this sets up a ground to enhance efficiency. In early phases of startups, founders make major hiring decisions (prior to funder intervention) and regarding setup an initial structure to the organization. In this study, I ask if having an organizational structure early-on helps firms scale-up faster.

Entrepreneurial ventures rely not only on founders but also on ‘joiners’, start-up employees who are attracted to entrepreneurship, but who do not want to be founders themselves. Both entrepreneurs-to-be and joiners-to-be are found to have some pre-entrepreneurial orientation (Roach and Sauermann 2015b), however, entrepreneurs-to-be have stronger preferences for autonomy, risk and commercialization than joiners do. In this chapter, I seek to address if early employees or ‘joiners’ are more likely to enter entrepreneurship as founding team members as opposed to those employees who join the start-up at later phases. Evidence that employees experiment in their current employment in order to assess their fitness for alternative employment put forth a new mechanism by which prior employment influences mobility of employees (Chatterji, de Figueiredo, and Rawley 2016). In a similar spirit, startups provide an interesting setting to understand career paths of their employees.

In second study or chapter 4, I focus upon employee human capital. Well-known Silicon Valley story of ‘treacherous eight’ who left Shockley Semiconductor and founded Fairchild Semiconductor, is one of the most cited examples in employee entrepreneurship literature. Eight of the employees of Shockley semiconductor, Sheldon Roberts, Eugene Kleiner, Victor Grinich, Jay Last, Julius Blank, Jean Hoerni, Robert Noyce, and Gordon Moore left to found Fairchild Semiconductor with \$1.5 million in venture capital funding from Arthur Rock, one of the earliest venture capitalists. This incident marked the origins of Silicon Valley. (Gompers,

Lerner, and Scharfstein 2005) discuss two views of entrepreneurial spawning process. In one view, employees of young entrepreneurial firms are exposed to a network of entrepreneurs and venture capitalists and this exposure is a learning opportunity to these employees. In another view of entrepreneurial spawning, employees of established firms leave the large bureaucratic companies, as these firms are reluctant to fund their entrepreneurial ideas. Although these views are not exhaustive, they cover a broad range of who spawn entrepreneurial firms, whether those working for young firms or those working for established firms. Another key observation from the Fairchild view is that these eight employees are not just individuals (also inventors in this context) working in an established firm, but are also early employees ('early joiners' henceforth) of Shockley Labs. They are employees who joined hands with the founder in the early phases after setting up Shockley labs i.e., their timing of joining the firm is different or early compared to those who joined later. Prior research did not pay sufficient attention to this important aspect of 'timing of joining'. Evidence of founding teams' human capital difference during early phases and later phases of start-up has been recently provided by (Tzabbar & Margolis (2017). Timing of joining the firm provides avenues for future research and underscores existence of heterogeneous workplace environment that start-ups provide to its employees. The basic premise of timing of joining is that early phases of start-up have a different workplace context compared to later phases. Thereby giving a glimpse of the learning opportunities that differentiate early employees or joiners from those employees who join the firm during later phases (later employees). In this paper, I focus on the timing of joining the startup and ask if early employees are more likely to enter entrepreneurship. By considering the timing during which employees chose to enter the startup, I intend to understand further the differential impacts on the career path of the employees. From a career perspective, studies related to career ladder of employees provide insights that employees are more likely to work

for larger organizations in the initial phases of their career (Bidwell & Briscoe, 2010). On the other hand, studies also provide evidence that employees who undertake riskier options early in their career have better future prospects (Chattopadhyay & Choudhury, 2017). In the light of these studies, I would like to examine if the career path of early employees is more rewarded compared to that of later employees.

In the third study or chapter 5, I explore the strategies of start-ups giving job titles to employees. Start-ups, as resource constrained entities cannot pay employees higher salaries that are on par with their large firm counterparts. So, they provide better/higher job titles. But, it is unknown if this hiring strategy of theirs helps them retain those employees who they give better job titles to. In this study, I take a question based approach and explore the correlation between higher job titles, experience of employees, timing of joining of employees and likelihood of their departure.

Table 1.1: Summary of dissertation studies

	Study 1	Study 2	Study 3
Chapter	Chapter 3	Chapter 4	Chapter 5
Title	Start-up to Scale-up: Role of hierarchy	Start-up experience as a stepping stone to entrepreneurship	Employee turnover in Start-ups
Research Question (s)	Does having an organizational structure early on help start-ups to scale-up?	Are early employees of start-ups more likely to enter entrepreneurship?	Start-ups often give senior titles to employees as part of their hiring and retention strategy. Can they retain these employees?
Level of Analysis	Start-up (Firm) Level	Employee (Individual) Level	Employee (Individual) Level
Data & Context	Internet based start-ups in India founded during 2004-2013		
Key Findings	Hierarchy that is setup in the initial phases of start-up is positively associated with growth of start- up. Initial functional structure is positively associated with growth of start- up.	Employees who are exposed to early phases of start-up are more likely to be future founding team members compared to those employees exposed to later mature phases of start-ups.	Employees with senior titles are less likely to leave start-ups. Start- ups retain the employees with senior titles compared to those employees without senior titles.

CHAPTER 2. Industry overview & Data Setting

Industry Context

The context of my dissertation is Internet based or consumer digital startups in India. These start-ups span across industry categories like consumer retail (eg. Flipkart, Healthkart etc.), travel (oyo rooms, TripFactory etc.), transport (Olacabs, Savaari etc.), real estate (Commonfloor, housing.com etc), food delivery (Zomato, Swiggy etc.), automobile (cardekho, carwale etc.) , education (Tutorvista etc) , recruitment (Merajob etc.). I shall henceforth refer to these firms as internet based or consumer digital start-ups in my dissertation.

For dissertation, I constructed a novel linked employer-employee dataset of Consumer Digital Startups (Internet based Startups) in India founded during 2004-2013. In contexts where there are no comparable registry datasets or census data, that provide detailed individual career information, we can use newly available sources like job portals where individuals self-report their career history. Such data sources open doors to previously unexplored yet important contexts. In this section, I shall briefly provide an industry overview and further describe the process of constructing the dataset.

As an emerging nation with a large Information Technology talent pool, there has been a surge in the number of startups registered in India. From being a major exporter of software in the previous decade, the transition to being an entrepreneurial hub is an interesting aspect that calls for exploration. Burgeoning interest of the government in entrepreneurial setting in India marks the transition of the perceptions towards entrepreneurial ventures in India. National programs and success stories are significantly boosting the image of entrepreneurs. In addition

to this, India boasts of world's fastest growing economy with second largest population who has access to internet.

This context posed two major challenges. First is the absence of employee registry data or any similar employee related database. Second, the industry itself is not well defined or firms categorized as internet based span multiple industries. As the boundaries of the sector is not well defined, I adopt a two-stage process for data collection. I put together the dataset in two phases; the first phase is to identify and compile the list of consumer digital startups in India founded during 2004-2013. This list consists of both surviving and exited startups. I used five external databases to compile the list of firms¹. I identified consumer digital start-ups using the descriptions of the companies in at least one of these five external datasets used. Later using domain information data², I identified their website registry dates. Using web archives, I gathered information pertaining to status of firm, whether surviving or not.³ The second phase was gathering employee information for employees of each company. This was possible by looking for public profiles of firms and gathering information of individuals who are either current or past employees of the firms. I shall describe this process in further detail in this chapter.

Final dataset is a linked employer-employee dataset that has granular information of the past and present employees of the startups and the career histories of individuals. Dataset comprises of employee public profiles of consumer digital startups whose website is registered during 2004-2013. The data are obtained from a well-known online careers portal that allows

1 Angellist, Bloomberg Businessweek, CrunchBase, Venture Intelligence and LinkedIn.

2 Whois.com

3 Archive.org

users to post resumes, connect with their job market peers, and aid them for job search. The data consists of information about education, occupation (e.g., finance, information technology, sales, management, founding team etc.). Similar data from a different context was used in prior studies (Ge et. al., 2016; Tambe & Hitt, 2013). Unlike previously used contexts where clearly distinguishing employees from founding team members was difficult, in this case, where data contains a distinct job title field, it is easy and straightforward to identify non-founding members or early employees of start-ups.

Similar data has been recently used by (Tambe and Hitt 2013a), where they compare mobility of IT employees using self-reported career data and other sources of employee data like census data. They found that their results are consistent across the data sources used for analysis. Employee data are not particularly skewed towards either higher or lower education levels. Although, the sample could be disproportionately weighted towards younger workers and those who switched their jobs. But, the nature of the context, consumer digital firms are internet based firms and young start-ups that should ideally have an internet presence and also their hiring activities are partially conducted online. So, I assume that most of their employees have an online presence and this sample is much closer to most of the datasets that have been used in multiple contexts in prior studies. Recent work by (Ge et. al., 2016) also provides evidence that such data comprising of online profiles is more reliable. They find that compared to online career history data, patent measures of mobility generate 12 percent false positives and 83 percent false negatives. Current context being service sector, patenting is not very active. Prior studies focused on only information technology workers or managerial workers. In this dataset, I have both managerial and IT employee information.

Origins of the sector

Origins of this sector in India can be traced to pre-dotcom era, dating back to 1996 with the introduction of B2B portals, but it could not take-off because of the internet infrastructural issues like low internet penetration, low consumer acceptance of online shopping and inadequate logistics infrastructure. Further dotcom bubble in early 2000 led to shutdown of many firms and activity in this sector was muted for nearly four to five years later until there is second wave of new firms from 2004 onwards. Software sector is the enabler and internet based startups can be seen as a result of productivity spillovers of the software sector. The interesting distinction is they are domestic market focused unlike large IT firms or software sector that has been majorly export-oriented. In terms of human capital, the startups in this sector are similar to the software sector. The aspect of ‘technocracy’ could be more pronounced in the high-growth sector as they are expected to deal with multiple industries and consumers as opposed to B2B models or client-focused models of pure-IT or software firms. I illustrate entry of start-ups in this sector in figure 2.1 using the dataset put together for current dissertation.

‘Job creation’ in this sector is shown in figure 2.2.

I shall further describe the process of data collection in this chapter. Internet based startups are not categorized under a specific industry code. Indian companies have NIC (National Industrial Classification) codes, but these are not very similar to that of SIC (Standard Industrial Classification) codes. So it was not straight forward to bundle up firms belonging to a specific NIC code and sample them. I collected data in two phases. In first phase, I compiled the list of consumer digital startups in India that founded during 2004 - 2013. This consists of both surviving and exited startups.

Data

Firm Data:

I used five external databases to compile the list of firms⁴. Any firms that described themselves as online retail, shopping, services, ticketing, travel etc., in at least one of the five external data sources, registered their website during 2004 - 2013 and have their headquarters in India, are present in the sample. Venture Intelligence, crunchbase and angellist are used to gather venture capital funding data. I gathered data regarding firm survival or time of firm shut down from internet archives⁵.

An alternate and ideal way of compiling firm list would be to start from the ministry of corporate affairs registries. These registries exist in almost every country with registration information of a firm (Guzman and Stern 2015). They also date back to many decades. The earliest date of company registration in India is 25th March 1857. Very importantly, from the comprehensive list of firms provided by the ministry, it is useful to know that there is no survival bias as this list of companies is independent of status of companies. They contain information like registered name, date, directors, email-id and address. Initially, I collected universe of registry data in India registered until end of 2014 from 2000 onwards. Although comprehensive, this information did not contain website domain names. From the email-id of contact provided, I further checked if this email id is domain specific or generic⁶. It came as a surprise that only 2 percent of firms have a non-generic email id's. These could be cases where

⁴ Angellist, Bloomberg Businessweek, CrunchBase, Venture Intelligence and company profile pages from LinkedIn.

⁵ <https://archive.org>

⁶ Domain specific email-id example: abc@flipkart.com

Generic email-id example: abc@gmail.com; abc@yahoomail.com; abc@rediff.com

domains are not reported or websites do not exist. In either of these cases, this finding validates digitization of firms' literature that not many companies are yet in mainstream technological standardization and there might be huge productivity gaps owing to this.

Even after gathering registry data, it remained difficult to identify what each firm does despite of having industry code (NIC). In addition, founders did not choose NIC consistently while registering their firms as there were no laws in place for e-commerce (Internet) sector yet and this in turn led to firms not having a specific industry code, mapping these to the description did not allow me to identify all firms that belong to consumer digital industry. Therefore, I resorted to publicly available information on other websites and compiled the list of firms as described previously. This long and comprehensive exercise stands futile attempt for this study, but on the contrary, it led to interesting insights about registry data in India. I share a few broad findings from registry data in appendix.

Employee Data:

In the second phase, I collected employee histories of both present and past employees of each company from a well-known job search and networking platform. This online careers portal allows users to post resumes, connect with their job market peers, and aid them for job search. This was possible by looking for public profiles of firms and gathering information of individuals who are either current or past employees of the firms. Only publicly available information of an individual is gathered. This consists of name, picture, work experience, job titles, job description, joining date, end date, company name, education institution, education degree and years of obtaining degree. Demographic details like place of birth, date of birth are not available. Personal details like email id or phone number of individual are also not

available. Also, in case of mobility of employees, it is possible that an employee who was working with one of the firms in the sample moved to a different country, say he moved from India to Australia. In such instances, I do not have the employee in the sample. All employees whose location at the time of data collection is India or USA are included in the dataset. Majority of employees move to USA and I gathered employee information if he is located in India or USA during the time of data collection. Gathering of raw data took over a span of a year, starting from January 2015 until December 2015.

Final dataset is a linked employer-employee dataset that has granular information of the past and present employees of the startups and the career histories of individuals. Dataset comprises of nearly 6000 firms and entire career histories of nearly 150,000 employees who worked in one of these 6000 these at any point in their career. Career history data consists of information about education, occupation (e.g., finance, information technology, sales, management, founding team etc.). Similar data from a different context was used in prior studies (Tambe and Hitt 2013b; Chunmian Ge, Ke-Wei Huang, & Ivan P. L. 2016).

Presence and availability of new data sources opens new avenues to conduct research. This is one example of research in such context where self-reported data facilitates research (Goetz et al. 2015).

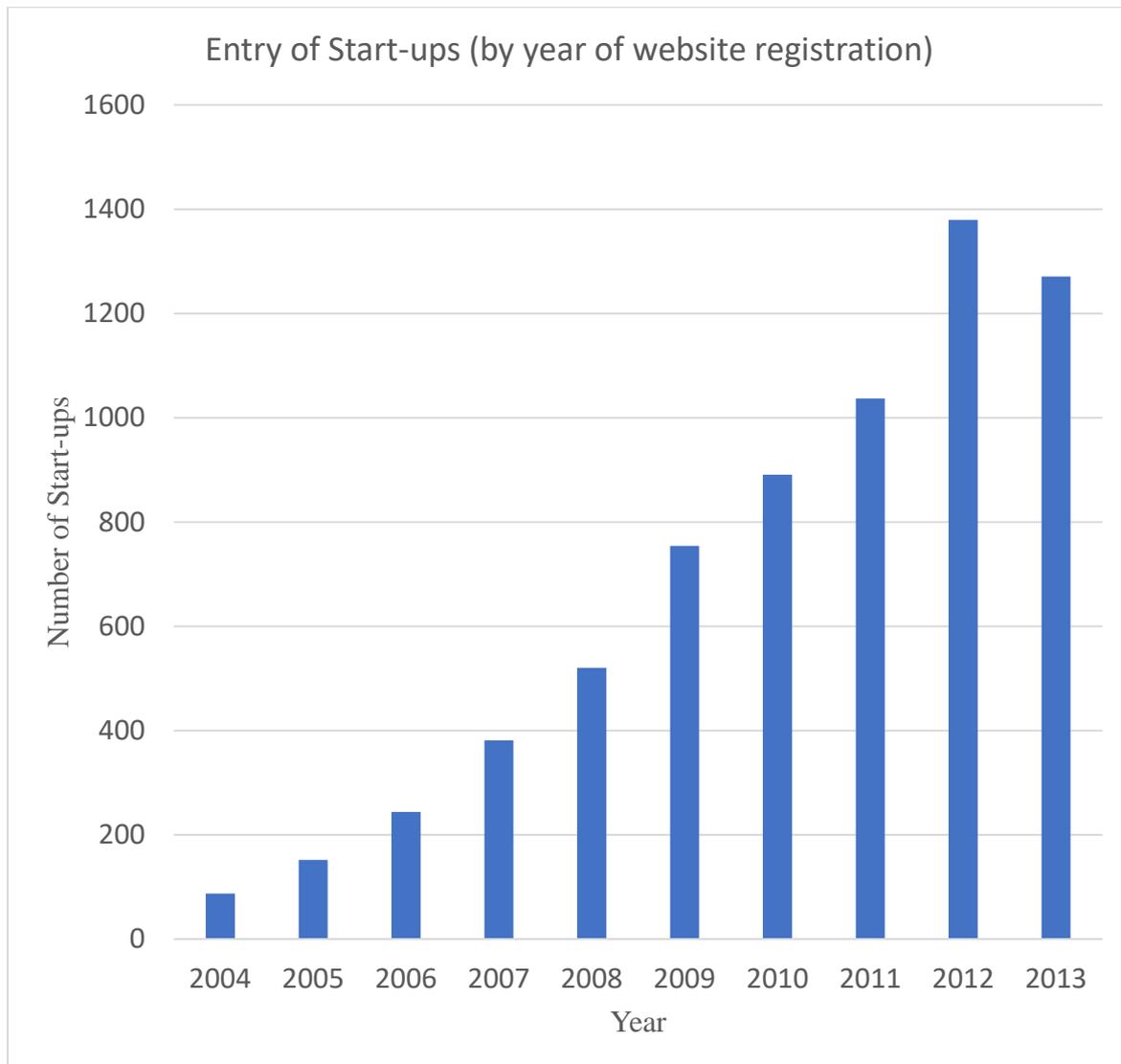
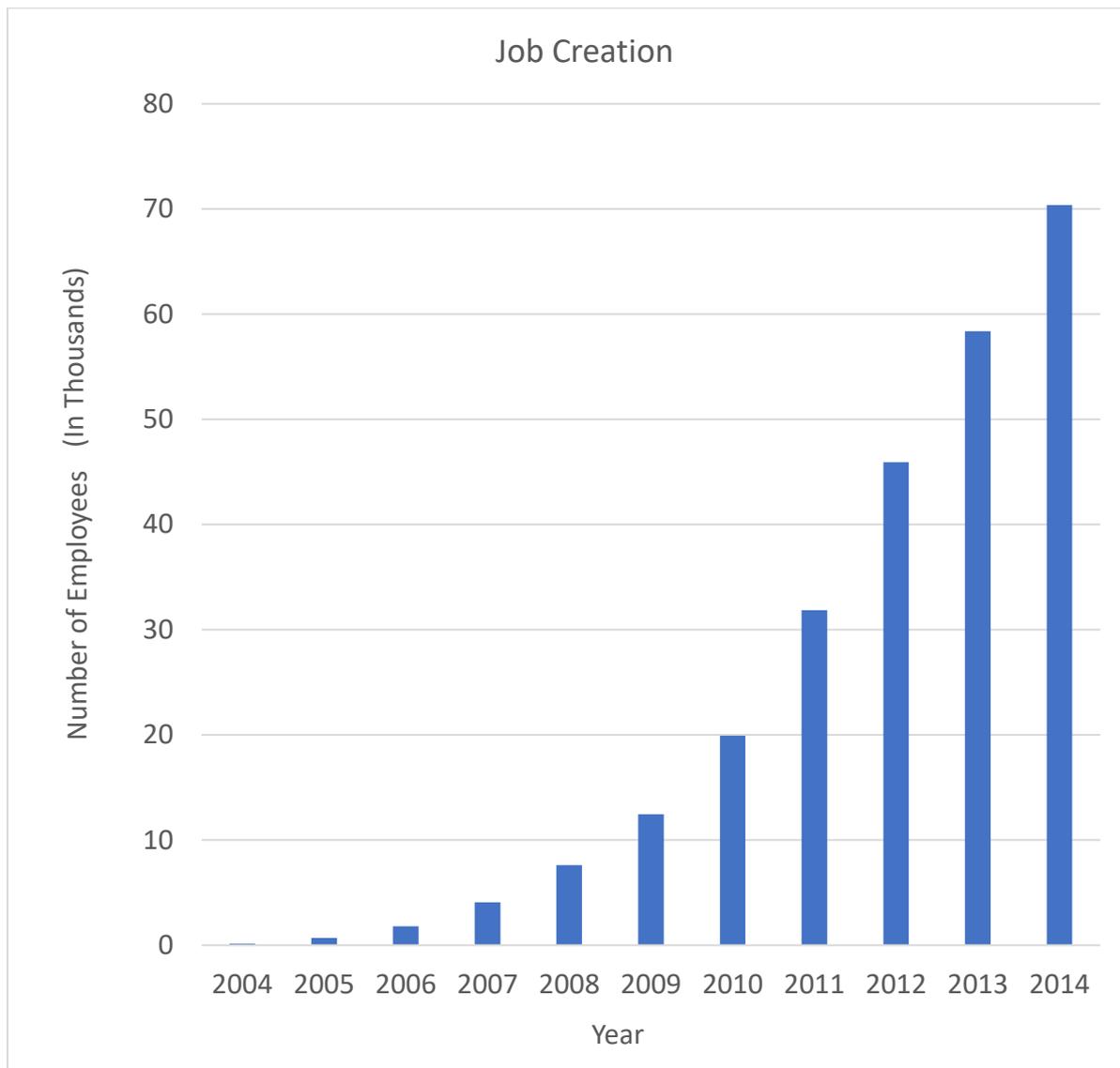
Figure 2. 1: Start-up creation in Internet Industry in India

Figure 2. 2: Job Creation in Internet Industry in India

CHAPTER 3. Start-up to Scale-up: Role of Organizational Structure

Abstract

Organizational structure is a double-edged sword. While contributing to improving efficiency on one hand, it also stifles innovation and creativity by constraining flexibility in an organization. While extant literature provides insights regarding costs and benefits of various aspects of organizational structure in an established firm context, it is less clear as to what role organizational structure plays in a start-up. This is majorly due to data constraints. Multiple research streams unite on underlying tradeoff between flexibility-efficiency when they refer to mixed effects of organizational structure. While start-ups are resource-constrained entities that are experimenting with their business models and flexibility is their strength that provides them a conducive environment to explore. Having an organizational structure can reduce decision-making time, coordination costs and improve efficiency of processes as start-ups setup routines required to scale-up. In this study, I ask if having an organizational structure early-on helps start-ups scale-up. Using a novel linked employee-employer dataset of internet-based start-ups in India; I focus upon hierarchy and horizontal functional structure in start-ups.

Introduction

Organizational structure is perceived as both accelerator and inhibitor of organizational performance. Evidence of a positive role of accelerator is through enhancing efficiency of processes, coordination and a negative inhibitor role by imposing constraints. These dual roles indicate a trade-off between efficiency and flexibility. Multiple and diverse research streams address the flexibility-efficiency trade-off in both established and young entrepreneurial firm contexts (hereby referred to as start-ups). This is also analogous to exploration and exploitation trade-off that is discussed extensively in prior literature (Levinthal and March 1993). In this study, I ask if having an organizational structure, specifically hierarchy and functional structure, early on helps start-ups in scaling-up.

Environment plays a key role in determining the type of structure that favors an organization. (Burns and Stalker 1961) argued that organic structure is more favorable in dynamic environments compared to a mechanistic structure. Organic structure is characterized by flexibility where there are no stated formal rules and no vertical hierarchical structure. This lack of formalization and presence of more horizontal coordination among members of the firm is referred to as organic structure. Prior research supports that such organic structure is positively associated with organizational performance in turbulent environmental conditions when compared to a mechanistic structure, which is more formalized and has vertical coordination among the members of the firm. There is ample evidence that provides support to organic structure, but all these studies primarily focused on established firms. There are fewer studies that test the implications of structure on firm performance in context of young and small firms.

In case of dynamic environments, it has been argued that the advantages of having a structure are beyond disadvantages of not having a structure. Although structure imposes certain constraints on exploratory processes in the firm, it also streamlines processes that act as hurdles to efficiency and delay action which cost the young start-up new opportunities to grow and scale-up. Evidence for advantages of organic structure have been provided in case of large, established firms. In smaller and young firms, there is no sufficient evidence as to what structure favors organizational growth. In younger firms, where structure is being built, organizational structure related decisions are few of hiring dilemmas discussed by Noam Wasserman. (Sine et. al., 2006) discussed that having a structure favors performance of entrepreneurial firms in a dynamic environment.

Start-ups play a key role in job creation. Despite of high failure rates, young firms grow more rapidly compared to their established mature counterparts (Haltiwanger et. al., 2013). Shifting policy focus on scale-ups⁷ (Isenberg 2012) indicates that employee growth is an important and relevant outcome. While growth in size of firms can be along many other dimensions like number of users, locations, product categories, customers, revenues, they may or may not be accompanied by increase in number of employees (Desantola and Gulati 2017). Also, noted distinction between growth and profitable growth (Sapienza et. al., 2006) establishes that all growth need not be profitable. Growth is operationalized in many ways and given that “there is no way of measuring an amount of expansion, or even size of a firm, that is not open to serious conceptual objection” (Penrose, 1959: 199) (Pe’er et. al., 2015), I shall

⁷ Isenberg, Daniel. "Focus Entrepreneurship Policy on Scale-Up, Not Start-Up." *Harvard Business Review* 21 (2012); <http://www.kauffman.org/microsites/state-of-the-field/topics/background-of-entrepreneurs/human-capital>

focus on employee growth in this study for economic relevance of job creation. In addition, owing to the context of my study, major resource for internet-based companies is their employees⁸ and in India, which is information technology intensive labor market, focuses on employee growth aspect of start-ups is highly relevant.

Start-ups are newly created ventures that face two challenges in order to create value, differentiation in the short-term and standardization in the long-term. Differentiation could be in creating new products or product varieties that nobody else manufactures, in developing production methods that are more efficient than that of the competition, or in targeting customer populations or needs that have been overlooked. Standardization is the process of reducing the idiosyncrasy of the firm and making the resources more replaceable and hence growing to be a more established firm (Rajan, 2012). These transitional phases occur as the start-ups mature. As start-ups transit from a phase of being synonymous with the founder to an expansion phase where the young firm ceases to be a start-up, hiring decisions and organizational structure play an important role in shaping up of the future of firm. Young firms, once they establish their product and grow further, get closer to the issues that established firms face in terms of managing teams, building hierarchy, hiring for key positions etc. The early phases of startups refer to the differentiation phase. This is also referred to as effectuation phase in entrepreneurship literature (Sarasvathy 2001). Effectuation is discussed at an individual level, where founder is involved in the process of exploration. These diverse streams of literature have a common underlying aspect, which is the flexibility-efficiency trade-off. This trade-off

⁸ 'The other side of paradise Glamorous tech startups can be brutal places for workers', The Economist (January 2016)

unites these diverse streams of literature, as it is often the key discussion (Davis et. al., 2009) in these research streams.

Using a novel employee-employer linked dataset of consumer digital start-ups in India, I explore if having an organizational structure early on helps start-ups in scaling-up. Taking into account the sudden growth opportunity that these start-ups in this industry had due to financial crisis that resulted in recession in labor market of large information technology firms, I explore if start-ups that setup an organizational structure early on were able to take advantage of this opportunity.

Theoretical Background & Hypotheses

In this section, I will briefly discuss theories of structure and performance of organizations. (Mintzberg 1989) definition of both structure and formal structure of an organization can be taken as the basis of organizational design studies that further this stream of research. “The structure of an organization can be defined simply as the sum total of the ways in which it divides its labor into distinct tasks and then achieves coordination among them.” Two major aspects underscored are division of labor and coordination. While formal structure is “the documented, official relationships among members of the organization”, informal structure is the “unofficial relationships within the workgroup.” We can observe the formal relationships or formal structure from the job titles given to members of organization. Observing unofficial relationships is the forte of network studies that document social and profession ties among organizational members. In this study, I will focus on formal structure of an organization.

In another classic text, Weber claims that ‘technically superior form of organization is a bureaucratic organization with its clear-cut division of activities, assignment of roles, and hierarchically arranged authority.’ This type of organization is superior compared to all other forms of organization according to Weber and formal structure here is associated with more organized processes that lead to efficiency gains. These efficiency gains are due to gain in speed, greater precision, task knowledge and continuity, which thereby reduce ambiguity and friction. This structure is termed as a more mechanistic structure since there are fixed rules and a structured way of dealing with coordination among members of the organization. Organizational structure alters the way information is processed with an organization (Williams and Mitchell 2004).

However, this positive relationship between structure and performance is contingent upon factors like size, age, technological development, external environment and managerial power (Mintzberg 1980). Congruence between design parameters and contingency factors is the key determinant for an appropriate structure. (Mintzberg 1980) provided a framework of design parameters and contingency factors. Job specialization, formalization, training, unit grouping and unit size are few design parameters discussed. Environment is one of the major contingency factors that influences organization design parameters.

Studies that examined these contingent factors provided evidence that formalized rules and structure are effective in a static environment when there is less uncertainty and lower need of adaptability for change, but do not hold in dynamic environments (Burns & Stalker, 1961; Sine et. al., 2006). Evidence for propositions by (Burns and Stalker 1961) that organic structure is more in dynamic environments is provided by many later scholars. At this stage, scholars

delved deeper into individual decision-making traits and cognitive abilities that increase the pace of decision-making when compared to executives relying on formal rules and procedures (Wally and Baum 1994). Succinctly, this stream of literature that provides evidence for dominance of organic structure over mechanistic structure argues that organic structure provides a more conducive environment for innovative industries (Aiken et. al., 1980). Studies provide empirical evidence that less structure is more efficient in dynamic environments (Eisenhardt and Martin 2000) and more structured firms perform better in less dynamic environments (Rivkin and Siggelkow 2003). Dynamic, hostile environments that seem to support an organic structure are often tested using data from established firm settings with a few exceptions (Sine et. al., 2006). Those studies that tested propositions of (Burns and Stalker 1961) in entrepreneurial firms found evidence for mechanistic structure having a positive relationship with performance in dynamic environments.

We can operationalize organizational structure in multiple ways like formalization, centralization, specialization, control span, administrative intensity etc. In this study, I will focus upon hierarchy and functional structure of an organization. Evidence for both benefits and costs of having a structured organization led to search for an optimal structure (Davis et. al., 2009). Too much or too little structure can dampen firm performance. This makes the tension between flexibility and structure an aspect addressing both established and entrepreneurial firms. There is ample evidence in established firm context. Owing to data availability constraints, there is relatively less progress in empirically examining flexibility-efficiency tradeoff in entrepreneurial firm context. This is similar to argument that relates to firm innovativeness. Competitive advantage of smaller firms is associated with their ability to attract inventive minds owing to a flexible organizational structure that enhances creativity

(Arora et. al., 2009). Less structure enables flexible action owing to characteristics like decentralized decision-making, broader and more fluid roles, wider span of control (Burns & Stalker, 1961; Sine et. al.,2006). Whereas more structure means specialized roles, centralized decision-making and formalization.

Knowledge based view of the firm reiterates that knowledge resides in individuals and structural perspective on knowledge emphasizes that organizational structure also consists of knowledge. Hence, positions that executives occupy change the nature of knowledge that they gain as they work and engage with others in the organization (Karim and Williams 2012). This interaction of knowledge among employees will be different from that in the scenario where there are no executive positions and all employees form a single team. Flexibility or lack of structure is associated with exploration while structure is associated with exploitation. The nature of trade-off is unclear as the cost of flexibility is not often restricted to efficiency but factors like limited attention, time delays, nature of opportunities and external environment contribute to uncertainty (Davis, Eisenhardt, and Bingham 2009). Theories underplay the factors that make exploration highly time consuming and mistake-prone. Hence, start-ups pay different price for flexibility and structure when facing a dynamic environment.

Of numerous dilemmas that founders' face, organizational design is a key internal organizing and hiring dilemma (Wasserman 2012). Notion of entrepreneurship as experimentation (Kerr et. al., 2014) emphasizes upon explorative activities that start-ups undertake in order to test market-fit of their products or business model. For example, two software engineers set out to start a price comparison website. Their initial idea was to compare prices of same product sold on multiple platforms. However, once they started working on their

idea, they realized that there were not many websites selling products online. This invalidated their initial idea of comparing prices across websites. However, it opened a new avenue and led them to set up an online bookstore that later expanded to multiple categories and currently is one of the largest ecommerce firms in India. This is usually the case with most internet-based firms. Founders explore with the initial ideas (models) they have and later pivot to another idea (model) which they perceive to be of greater value. Pivoting is the process of moving on from one idea (model) to another to maximize value creation. Such activities are analogous to innovation activities discussed in exploratory contexts.

In such instances, founder is in a dilemma whether to start building an organizational structure early on or not. This structure poses a short-term threat to the survival of firm by imposing constraints on the exploration process. Organizational structure is the presence of certain rules and framework in an organization. Absence of a structure is regarded as flexibility. Flexibility is suitable for exploratory processes and organizational structure to exploitative processes. Structure constraints organizational activities during an exploration phase, whereas during an exploration phase, structure provides a neat scaffolding to increase pace of decision making. Hierarchy would enable quick decision-making since there is no need to disrupt everyone's work in the department for every simple decision. When the start-up is young and small, every day meetings and summarizing of individual experience every day is relatively easy although it is a tedious and time-consuming task. However, as firm grows and ages, it gets difficult to gather up everyone's opinion and waiting for consensus may lead to firm missing opportunities.

In case founder does not setup a structure early on then he is going to face trouble scaling-up the firm when he needs more hiring to do. In addition, imprinting theory provides us with evidence that early decisions of founders stick for a longer duration. (Beckman and Burton 2008) found that initial functional structure that start-ups setup at the founding phase shapes both breadth and depth of subsequent functional structure. Tasks also define the structure of the firm. Start-ups can choose to hire employees to span various departments, but need not specifically create positions and a head for each department before they take up tasks in that department. For example, they can have a sales person before they have a Vice President of Sales department. Breadth of the functional structure created by startups can be another type of organizational structure that is relatively flexible yet has a form.

In this context, I hypothesize the following

Hypothesis 1:

Initial hierarchical structure is positively associated with firm growth.

Hypothesis 2:

Initial functional structure is positively associated with firm growth.

Flexibility can be as simple as a case where for example an employee requiring installation of a software on his computer. In a few preliminary interviews with employees,

one employee provided me some valuable insights regarding flexibility. She has experience working in established firms as well as start-ups⁹. In her words,

“Startups have very flexible installation policies and they adapt to the changing technologies easily compared to large firms. I was able to readily install open Source software at both startups I worked in where as in current large organization, I will have to follow security and IT protocols in spite of it being a no cost open source installation.”

Endogeneity concerns:

Growth of firms is endogenous to founding team decisions of setting up a structure. Founders set up a structure early on if they want to grow or anticipate growth. In such instance, it is difficult to observe if the strategy of setting up an initial structure leading to growth or if it is growth intent driving the strategy of founders. Recent financial crisis is an unanticipated growth shock to start-ups in this sector. Start-ups located in IT clusters had a chance to hire talent from large IT firms who suddenly became more mobile due to the crisis.

Recent global financial crisis of 2008-2009 affected large Information Technology (IT) firms. Their export revenues plummeted during the crisis. Software export growth trend from 2000-2015 are in figure 3.1. Revenues of large IT firms are mostly project based, large share of which is from exporting software services (Arora and Gambardella 2005). The number of

⁹ In order to maintain privacy of employee, I do not reveal personal details like name and names of companies. She worked in two start-ups & joined both start-ups within a year of their setup. Recently in 2016, she moved to a larger firm. Prior to working in start-ups she has a large firm experience in infrastructure and construction industry. (as a civil engineer)

employees hired per project by these large IT firms is directly proportional to revenue of the project. So, as the number of projects decreased or revenue per project decreased when the project specifications when clients ended their relations with the large firms, the first thing that these firms had to do was to freeze further hiring and to release some of their employees working on the project.

 Figure 3.1 about here

So, in order to cut down costs, large IT firms had to downsize by either laying off or letting go many of their employees owing to lack of projects from multinational clients. These firms always hired more than their required capacities and had employees on the bench. So, during this period, when there was a drop in export revenues, these firms reduced their hiring, laid-off or let-go employees and moved employees from projects to on-the-bench status. Probability of mobility of all affected pool of employees increased during this period. Large IT firms are restricted to IT clusters. This led to an increase in mobility of IT human capital in IT clusters. All employees whose mobility is increased are qualified to work for internet-based start-ups, which means there is a sudden unanticipated increase in IT labor market pool in IT clusters.

According to Marshall's industrial agglomeration theory (Marshall 1920), firms within clusters have lower transport costs, these can be costs of moving goods, people, and ideas. Also firms in clusters have easy access to labor as the cost of hiring is lower for both individuals and firms (Pe'er and Keil 2013). Similar labor needs of firms within clusters is well established in

prior literature (Ellison et. al., 2010). Recession had a positive labor market shock for start-ups located in IT clusters and not having any such positive benefit to those situated outside IT clusters. This is because most of the large IT firms that were affected due to recession are located in IT clusters. Consumer digital start-ups or e-commerce start-ups are not entirely similar to IT firms, but these large IT firms are their labor market peers. The major difference between these sectors is that the start-ups considered for this study predominantly serve the domestic Indian market unlike large IT firms that is highly dependent upon markets outside India for their revenues. For example, I shall compare Flipkart and Infosys. Flipkart is an e-commerce firm that operates in the segment of online retail, it started as a book selling platform that later expanded its categories to electronics, clothes, etc. On the other hand, Infosys is a large IT firm that deals with both domestic and offshore clients with export revenues as a major chunk. During the recession period, Infosys had to lay off lot of employees and freeze hiring of fresh graduates. Infosys has its offices located in IT clusters like Bangalore, Hyderabad, Pune, etc. All the employees who were on the bench or were moved to the bench from their existing projects were now more mobile and were willing to join start-ups like Flipkart. Although both Flipkart and Infosys are not direct competitors, they are peers in labor market where they are competing to hire similar graduates and employees with similar kind of experience. This is mostly true for IT employees.

Very few studies explored labor market implications of 2008 financial crisis. Evidence from the job openings and labor turnover survey (JOLTS) data in US, (Lazear and Spletzer 2012) show that there is no reduction in jobs during recession, but there is a churn in labor market where workers moved from less productive employment to more productive employment. Extending this finding to Indian labor market, it can be expected that individuals

moved from less productive large IT firm jobs to more productive start-up jobs in consumer digital market.

By exploiting the difference in location of start-ups, I use a difference-in-difference methodology to estimate the effect of initial structure on growth rate of start-ups. Start-ups located in IT clusters belong to treatment group while those not situated within clusters belong to control group. Recession or financial crisis, which is the positive labor market shock for start-ups, is the treatment.

Context & Data

The context of the study is consumer digital startups or internet based startups in India founded during 2004 - 2013. I use a linked employee-employer dataset constructed entirely using publicly available information on internet. I consider this as a suitable context for the current two reasons, economic relevance and data assumption relevance. This sector is fast growing sector in India and employs a large chunk of IT human capital. I collected data entirely using publicly available sources. This sector being online/internet based start-ups; it is a fair assumption that these firms should have had an online presence at some point in their life. In addition, with respect to employees, since these firms hire mostly IT human capital, it is also fair to assume that career profiles of most of their employees is available online.

Context used for this study posed two challenges, no existing standard databases that provide a list of firms or employee data and an undefined sector. Detailed process of data collection is described in chapter 2. In this chapter, analysis is at a firm level.

An employee who heads the organization design team in an accelerator¹⁰ located in US but that mentors start-ups across the globe gave me a sneak peek of their program and helped me understand their mentoring process. However, the most interesting insight that she gave me was, every time they offered suggestions to their enrolled Non-US start-ups, they have the following disclaimer

“But, this is how we do it in the valley, we are not sure it might work you”

Measures & Methods

In this section, I will discuss the dependent, independent and control variables used in the study. Descriptive statistics are provided in table 1.

Dependent Variable:

Organization size and growth rate are the two dependent variables used in this study. (Organization size)_t is measured as $\log[1+(E)_t]$, where E is the number of employees and time t is at a quarterly level.

Growth Rate of the firm is the second dependent variable used in the study. A substantial fraction of the entrepreneurship literature has used growth as a measure of performance of firm, and a large number of different ways to operationalize it have been proposed (Gilbert, McDougall, and Audretsch 2006). Given that I look start-ups that have employees as their initial investment and strategic choice, this measure of employee growth

¹⁰The largest information technology company in US runs accelerator.

will be suitable, because firms invest in employees ahead of other measures of growth, such as sales growth. I measure the growth of a firm as the relative growth rate in employees, (G_t) from time $t-1$ to time $t-2$, formally stated as $G_t = (E_t - E_{t-1})/(E_{t-1})$. Time is measured at a quarterly level in this study. Given that there is no way of measuring an amount of expansion, or even size of a firm, that is not open to serious conceptual objection (Pe'er, Vertinsky & Keil, 2015).

$(\text{Growth rate})_t = (E_t - E_{t-1})/(E_{t-1})$, where E is the number of employees.

Independent Variables:

I use job titles information provided by employees to measure hierarchy and functional structure.

Hierarchy is proxied using sum of number of vertical levels of positions that firms have. Chief, Associate/Assistant Vice President and managerial/executive levels are the vertical levels of positions that firms can have. Levels of positions are

C-level: takes a value 1 if firm has C-level positions exist in the start-up.

VP level: takes a value 1 if President, VP & AVP level positions exist in the start-up.

Executive: takes a value 1 if Executive/managerial positions exist in the start-up.

Hierarchy = sum of (C-level, VP level & Executive)

Hierarchy is a number that takes a value 0-3

Initial hierarchy is the number of hierarchy levels present in year 1, i.e., the first four quarters after the firm is set-up.

Functional Structure:

In order to measure functional structure, I adopted the measure used by (Beckman and Burton 2008). I classified job titles of all employees into 6 categories, sales and marketing, general administration (including human resources), science/R&D/engineering, operations, business development/strategic planning, and finance/accounting. (Beckman and Burton 2008) classify only executive positions, but I classify all employees hired by the start-up and this measure is not exactly the same as theirs since all employees functional task is taken into account and not only executive positions. After classifying all employees into these categories, I sum the number of functions that the start-up has by end of fourth quarter it is setup.

Functional structure is the sum of number of functional positions that have at least one employee working and takes the value of 0-6. There can be an overlap of employees in multiple functions.

Controls

Age of start-up and industry age. Both measured in quarters.

Founding team Size: Number of founding team members.

Hierarchy team Size: Number of members of organization occupying C-level, VP, AVP and executive/managerial level positions.

Descriptive Statistics are presented in Table 3.1

 Table 3.1 about here

Difference-in-difference estimates measures

Post-recession takes a value 1 from year 2009 onwards and 0 otherwise.

Cluster takes a value 1 if the firm is located in a IT cluster and 0 otherwise. IT clusters in this case are tier 1 cities in India, which are Bangalore, Delhi, Chennai, Hyderabad, Pune, Mumbai, and Kolkata.

Methods

For Hypotheses 1 & 2, I use OLS regression.

For recession shock difference-in-difference analysis, I test the following specification:

$$\begin{aligned} \text{Growth Rate}_{it} = & \beta_1 * \text{Post-recession} + \beta_2 * \text{Cluster} + \beta_3 * \text{Initial Hierarchy}_{t0+} \\ & + \beta_4 * \text{Post-recession} * \text{Cluster} + \beta_5 * \text{Post-recession} * \text{Initial Hierarchy}_{t0+} \\ & + \beta_6 * \text{Cluster} * \text{Initial Hierarchy}_{t0} + \beta_7 * \text{Post-recession} * \text{Cluster} * \text{Initial Hierarchy}_{t0+} \\ & + \lambda_i + \varepsilon_t \end{aligned}$$

where,

Post-recession is a dummy variable that takes a value 1 for year 2009 onwards and 0 otherwise.

Cluster is a dummy variable that takes a value 1 if the start-up is located in an IT cluster else takes a value 0.

And λ – firm level controls; ε – time controls (year)

Similarly, I test the following specification if this holds for functional structure

$$\begin{aligned} \text{Growth Rate}_{it} = & \beta'_1 * \text{Post-recession} + \beta'_2 * \text{Cluster} + \beta'_3 * \text{Initial Functional Structure}_{t0+} \\ & + \beta'_4 * \text{Post-recession} * \text{Cluster} + \beta'_5 * \text{Post-recession} * \text{Initial Functional Structure}_{t0+} \\ & + \beta'_6 * \text{Cluster} * \text{Initial Functional Structure}_{t0} + \beta'_7 * \text{Post-recession} * \text{Cluster} * \text{Initial} \\ & \text{Functional Structure}_{t0+} + \lambda'_i + \varepsilon'_t \end{aligned}$$

where,

Post-recession is a dummy variable that takes a value 1 for year 2009 onwards and 0 otherwise.

Cluster is a dummy variable that takes a value 1 if the start-up is located in an IT cluster else takes a value 0.

And λ' – firm level controls; ε' – time controls (year)

Results

Descriptives in Table 3.1 show that the maximum value that initial hierarchy variable takes in 2 and minimum is 1. The mean of variable is 0.02 , which shows that very few firms (around 2%) have hierarchy greater than 0. This leads to possible scenarios where there could be some random missing values or very small firms did not have or report their founding team member as C-level.

Table 3.2 provides OLS regression results for models with hierarchy as the independent variable and organization size as dependent variable. We can see that hierarchy is positively associated with size of the start-up. Coefficient of initial hierarchy is positive and significant. Model (1) has only year fixed effects and no other controls. In model (2), age of startup and age of industry (both in quarters) are included. Age of start-up is positively related to firm size, whereas age of industry is negatively associated with firm size. In model (3), size of founding team is included. Size of founding team is available only for part of firms in the dataset and so the number of observations is lower compared to that of model (1) & model (2). Coefficient of founding team size is also positive and significant. Team size comprising of individuals forming the hierarchical structure is also included as one of the controls in model (4). This is to control for cases where there are larger teams but less hierarchical, for example there could be 5 C-level individuals but this is counted as only 1 in hierarchy variable as all of them belong

to single C-Level category and no other level. Even after inclusion of hierarchical team size control, the coefficient of hierarchy is significant and positive.

Table 3.2 about here

In Table 3.3, I provide results of OLS regression with hierarchy as independent variable and growth rate of the firm as dependent variable. In model (1), I included only hierarchy variable and year fixed effects with no other controls. Coefficient of hierarchy is positive and significant. In model (2), age of start-up and industry age controls are included. Coefficient of hierarchy is still significant and positive. Coefficient of age of start-up is negative and significant, i.e., age of start-up is negatively associated with growth rate of start-up. This implies that as start-ups age, they grow slower. Coefficient of industry age is also significant and negative. As industry ages, start-ups grow slower. In Model (3) & model (4), founding team size is included. Start-ups with larger founding teams grow faster. Coefficient of founding team size and growth rate of start-ups is positive and significant. In model (4), hierarchy team size variable is included. Coefficient of hierarchy team size is not significant. All models include year fixed effects.

Table 3.3 about here

In table 3.4, OLS regression results with initial functional structure as independent variable are presented. Dependent variable is organizational size. All three models have year fixed effects included. In model (2), age of start-up and age of industry are controlled for. In model (3), founding team size control is included. Coefficient of initial functional structure is positive and significant in all three models consistently. Coefficient of age is also positive and significant. Coefficient of industry age is negative and significant. These results are consistent with the results presented in table 1. Start-ups with greater initial functional structure grow larger in size. Start-ups with a larger founding team also grow larger in size.

 Table 3.4 about here

In table 3.5, OLS regression results with initial functional structure as independent variable are presented. Dependent variable is growth rate. All three models have year fixed effects included. In model (2), age of start-up and age of industry are controlled for. In model (3), founding team size control is included. Coefficient of initial functional structure is positive and significant in all three models consistently. Coefficient of age is negative and significant, i.e., with age start-ups grow larger in size but at a lower pace. Coefficient of industry age is negative and significant. These results are consistent with the results presented in table 2. Start-ups with greater initial functional structure grow faster. Start-ups that have a larger founding team also grow faster.

 Table 3.5 about here

In table 3.6, difference-in-difference estimates of firms within cluster and without cluster with recession as treatment are presented. In model (1) no fixed effects are included, model (2) has only firm fixed effects and model (3) has both firm and year fixed effects. In model (1), coefficient of post-recession variable, β_1 is negative and significant, which means that firms had a lower growth rate after the crisis. Coefficient of initial hierarchy variable is positive and significant. In model (3) after both firm and year fixed effects are included, the main effect variables are dropped because of collinearity and only the interaction effects remain. Constant term is absorbed in model (2) & model (3). Linear model with two dimension fixed effects¹¹ is used (Correia 2016). Coefficient of interaction term between cluster and post-recession variable, β_4 is positive but not significant in all three models. This does not allow me to reject null hypothesis that firms in a cluster post-recession do not exhibit higher growth rates than those not situated in a cluster. Coefficient of interaction between Post-recession and initial structure, β_5 is negative and significant, which means that growth rate of firms with higher levels of initial structure had slowed down post-recession. Having a hierarchical structure early on held back the firms during recessionary times. This also means that firms with higher initial levels of flexibility grew better post-crisis and being located in a cluster which is a positive dynamic environment slowed down their positive growth rate. Coefficient of interaction between post-recession, cluster and initial hierarchy is positive and significant. This β_7 is the

¹¹ reghdfe package in stata.

coefficient of major interest that allows me to reject null hypothesis that having a hierarchical structure early on does not influence growth rate. Firms located in an IT cluster and having an initial hierarchical structure have $(\beta_4 + \beta_7)$ 12 % higher growth rates compared to those firms outside the cluster.

 Table 3.6 about here

In table 3.7, difference-in-difference estimates of firms within cluster and without cluster with recession as treatment are presented. The variable of interest here is initial functional structure. In model (1) no fixed effects are included, model (2) has only firm fixed effects and model (3) has both firm and year fixed effects. Coefficient of interaction between post-recession and initial functional structure is negative and significant. Coefficient of interaction between cluster, initial functional structure and post-recession is not significant. This is unlike the result with initial hierarchy. Firms that have a functional structure early on and located within the IT clusters do not have any benefits from the positive labor market shock. Whereas those firms within the IT clusters with a hierarchy early on could grow faster.

 Table 3.7 about here

Discussion

Results suggest that having an organizational structure helps the start-up to scale-up. Post-recession period can be seen to have negative effect on growth of start-ups. But, being located in clusters eased this pressure slightly and these firms in IT clusters did better compared to those outside IT clusters. Growth of firms in the current study are conditional on survival of firms. A large number of firms in this sector tend to survive; it is that they are dormant. Dormancy rates of firms in this sector are large as the costs of maintaining a website are very low. In the current study, since dormancy rates are high, I assumed survival to pose a smaller challenge as most of the firms in the sample tend to exist.

The case that descriptive statistics in Table 3.1 suggest where there is no initial hierarchy for majority of start-ups has to be revisited in the study. An alternative way of dealing with such scenario would be to presume that some sort of structure does exist in initial phase of any firm, i.e., even if it is a single person who started then the variable must take a minimum value of 1. Assigning a minimum value of 1 to all firms which have zero hierarchy and looking at the results again will give a sense of how results like in such scenario where actual measure is difficult due to data constraints.

I will discuss limitations posed by the dataset to this study. For firms that age and remain smaller, one key factor that can explain this could be the founder motivation. In this case, founder motivation to grow the firm is not observable. Only size of the firm is observable. Unlike in research-intensive industries where patenting activity is an alternative measure of performance, in this study I do not observe any other alternative performance measure. Website related measures like number of user-clicks or Alexa ranking can be an alternative. I will

include these measures as part of my future work for additional analysis. All the firms in the sample are private firms and there is very limited information regarding financial performance. Financial measures like revenues per employee or earnings that are commonly used are not available in this case.

It is likely that professionalization of firms can be seen closer to funding timelines (Hellmann and Puri 2002). I haven't included any venture capital funding information in the current study. I shall further include venture capital funding information in future. Among the six thousand firms in current study, only very few firms received venture capital. This about hundred firms received funding. To briefly summarize, I shall further include an improved measure of initial hierarchy variable and funding status details of start-ups in order to test further robustness of current results. In conclusion, this study connects entrepreneurship and organizational structure literature and aims to contribute to stream of entrepreneurship literature focusing upon scale-ups, by using a novel emerging market setting.

Table 3. 1 : Descriptive Statistics

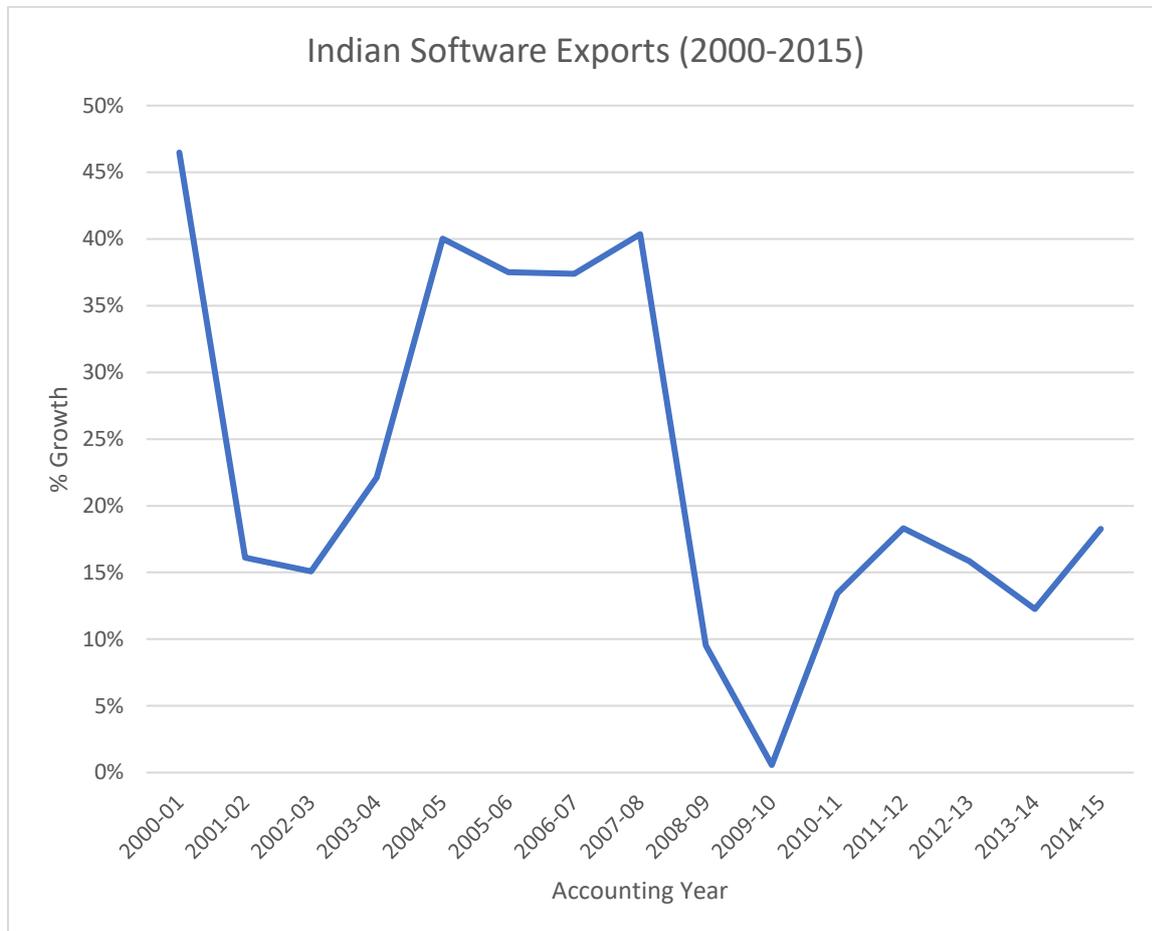
	Variable	N	mean	sd	min	max
1	log(Org Size)	111526	1.049	1.154	0.000	8.539
2	Growth Rate	104810	0.062	0.235	-1.686	1.826
3	Initial Hierarchy	111475	0.026	0.174	0	2
4	Initial Functional Structure	111475	0.081	0.464	0	6
5	Start-up Age	111526	11.238	8.294	1	44
6	Industry Age	111526	33.425	8.415	1	44
7	Founding team size	59164	1.223	0.609	1	12
8	Hierarchy team size	111475	0.070	0.750	0	22
9	Post-recession	111526	0.910	0.286	0	1
10	Cluster	111526	0.188	0.391	0	1

Correlation Matrix

	1	2	3	4	5
1	1				
2	0.179	1			
3	0.230	0.047	1		
4	0.276	0.052	0.768	1	
5	0.405	-0.133	-0.018	-0.016	1
6	0.118	-0.091	0.009	0.008	0.340
7	0.161	0.052	0.122	0.123	-0.058
8	0.217	0.032	0.626	0.707	0.001
9	0.085	-0.052	0.008	0.007	0.203
10	0.059	0.012	0.006	0.001	0.015

	6	7	8	9	10
6	1				
7	0.047	1			
8	-0.010	0.103	1		
9	0.685	0.037	-0.005	1	
10	-0.013	-0.020	-0.015	-0.005	1

Figure 3. 1: Software exports trend 2000-2015¹²



¹² Plot using data from :

Richard Heeks, University of Manchester (<https://ict4dblog.wordpress.com/about-ict4dblog/>)

Table 3. 2
Independent Variable: Initial Hierarchy

Dependent Variable: Organization Size

VARIABLES	(1) ln(Org Size)	(2) ln(Org Size)	(3) ln(Org Size)	(4) ln(Org Size)
Initial Hierarchy	1.518*** (0.019)	1.575*** (0.018)	1.421*** (0.022)	0.922*** (0.029)
Start-up age		0.059*** (0.000)	0.064*** (0.001)	0.063*** (0.001)
Industry age		-0.013*** (0.003)	-0.015*** (0.004)	-0.014*** (0.004)
Founding team size			0.322*** (0.007)	0.315*** (0.007)
Initial Hierarchy team				0.170*** (0.006)
YearFE	Y	Y	Y	Y
Observations	111,475	111,475	59,136	59,136
R-squared	0.067	0.222	0.251	0.261

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3.3
Independent Variable: Initial Hierarchy

Dependent Variable: Organization Growth Rate

VARIABLES	(1) Growth Rate	(2) Growth Rate	(3) Growth Rate	(4) Growth Rate
Initial Hierarchy	0.064*** (0.004)	0.061*** (0.004)	0.054*** (0.005)	0.051*** (0.007)
Start-up age		-0.003*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)
Industry age		-0.011*** (0.001)	-0.011*** (0.001)	-0.011*** (0.001)
Founding team size			0.017*** (0.002)	0.017*** (0.002)
Initial Hierarchy team				0.001 (0.001)
YearFE	Y	Y	Y	Y
Observations	104,783	104,783	55,660	55,660
R-squared	0.011	0.025	0.032	0.032

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3. 4
Independent Variable: Initial levels of formalization

Dependent Variable: Organization Size

VARIABLES	(1) ln(Org Size)	(2) ln(Org Size)	(3) ln(Org Size)
Ini.Func. Structure	0.684*** (0.007)	0.703*** (0.006)	0.621*** (0.008)
Start-up age		0.059*** (0.000)	0.064*** (0.001)
Industry age		-0.014*** (0.003)	-0.015*** (0.004)
Founding team size			0.308*** (0.007)
YearFE	Y	Y	Y
Observations	111,475	111,475	59,136
R-squared	0.090	0.246	0.278

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3. 5
Independent Variable: Initial Functional Structure

Dependent Variable: Organization Growth Rate

VARIABLES	(1) Growth Rate	(2) Growth Rate	(3) Growth Rate
Ini.Func. Structure	0.027*** (0.002)	0.026*** (0.002)	0.022*** (0.002)
Start-up age		-0.003*** (0.000)	-0.004*** (0.000)
Industry age		-0.011*** (0.001)	-0.011*** (0.001)
Founding team size			0.016*** (0.002)
YearFE	Y	Y	Y
Observations	104,783	104,783	55,660
R-squared	0.011	0.026	0.032

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3. 6: Difference-in-Difference estimates (Initial Hierarchy)

VARIABLES	(1) Growth Rate	(2) Growth Rate	(3) Growth Rate
Post-recession	-0.013*** (0.003)	0.025*** (0.005)	
Cluster	0.002 (0.007)		
Initial Hierarchy	0.199*** (0.019)		
Post-recession * Cluster	0.008 (0.007)	0.004 (0.010)	0.005 (0.009)
Post-recession * Initial Hierarchy	-0.141*** (0.019)	-0.196*** (0.037)	-0.194*** (0.037)
Cluster * Initial Hierarchy	-0.082** (0.036)		
Post-recession*Cluster*Initial Hierarchy	0.077** (0.037)	0.114** (0.048)	0.112** (0.047)
Start-up age	-0.004*** (0.000)	-0.005*** (0.000)	-0.014*** (0.001)
Constant	0.117*** (0.003)		
Observations	104,783	104,783	104,783
R-squared		0.101	0.104
Number of firmid	6,692		
FirmFE	N	Y	Y
YearFE	N	N	Y

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3. 7: Difference-in-Difference estimates (Initial Functional Structure)

VARIABLES	(1) Growth Rate	(2) Growth Rate	(3) Growth Rate
Post-recession	-0.014*** (0.003)	0.025*** (0.005)	
Cluster	0.001 (0.007)		
Ini.Func. Structure	0.063*** (0.006)		
Post-recession * Cluster	0.008 (0.007)	0.005 (0.010)	0.005 (0.009)
Post-recession * Ini.Func. Structure	-0.040*** (0.006)	-0.060*** (0.015)	-0.059*** (0.014)
Cluster * Ini.Func. Structure	0.029 (0.024)		
Post-recession*Cluster*Ini.Func. Structure	-0.022 (0.025)	-0.011 (0.030)	-0.011 (0.029)
Start-up age	-0.004*** (0.000)	-0.005*** (0.000)	-0.014*** (0.001)
Constant	0.116*** (0.003)		
Observations	104,783	104,783	104,783
R-squared		0.101	0.104
Number of firmid	6,692		
FirmFE	N	Y	Y
YearFE	N	N	Y

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

CHAPTER 4. Start-up experience as a stepping stone to entrepreneurship

Abstract

In this study, I examine the broader question of where do founders come from. I focus beyond the founding team and on the employees of startups. I ask if employees exposed to early phases of start-ups (early hires) are more likely to enter entrepreneurship compared to employees who join the startup in a later phase (later hires). Startups are both employment generators and experimental environment providers that nurture their employees' skills. They rely not only on founders but also on employee human capital. Like the returns of entrepreneurship that founders gain, employees can also have returns to their start-up experience. Though there is ample research on formation of founding team and complementarities among the founding team members, relatively fewer studies focus on human capital of early employees, who are also a key part of the start-up taking significant career risks like founding team members and constitute the major chunk of initial investment of start-ups. Organizational roles that employees hold in these start-ups also play a key role on their career path. I also look at how employees holding managerial or functional roles differ in their mobility decisions. Combining insights from literature that introduces joiners as different type of entrepreneurial actors, prevalence of small firm effect on entrepreneurial spawning and experimentation of employees with their career paths, I contribute to employee entrepreneurship literature using a novel linked employer-employee dataset of Indian internet based startups.

Introduction

Workplace context plays a key role in shaping employee decision to enter entrepreneurship (Chatterji 2009). Employee entrepreneurship literature provides well-documented evidence of significance of prior work experience in founding an organization. Majority of entrepreneurial spawning studies provide evidence of employee entrepreneurship using an established firm setting (Campbell et. al., 2012; Chatterji, 2009; Kacperczyk & Marx, 2016; Klepper & Sleeper, 2005). Established large firms act as springboards to employees to enter entrepreneurship as this experience aids employees to gain financial resources, accumulate social capital, augment their technical skills, and identify entrepreneurial opportunities (Chatterji 2009). While experience in an established firm is valuable, it is observed that long run earnings of employees who worked for a start-up is more than that of employees who have no work experience in a startup (Campbell 2012). This positive earnings effect of start-up experience is attributed to both individual and contextual factors related to workplace. Less is known about how start-up experience fuels entrepreneurial endeavors. Taking into account individual ex-ante career preferences, (Roach and Sauermaun 2015b) introduced 'joiners' as entrepreneurial actors who have some entrepreneurial interests in common with founders and want to join a startup, but do not want to be founders themselves. But, this study treats startup as a static entity and does not explicitly reveal preferences of joiners with regard to the phase of startup they would like to be part of. Startups, being dynamic entities, workplace context that joiners need to face differs in accordance with the undergoing phase of startup. In this study, I explore if likelihood of employee entrepreneurship varies conditional on their exposure to different phases of start-up, early or late.

‘Where do founders come from?’ is a long-standing question of employee entrepreneurship literature and I ask if start-ups act as nurturing grounds for employees thereby facilitating entrepreneurial entry. (Sørensen and Fassioto 2011) discussed organizations as fonts of entrepreneurship in case of established firms. This study extends this argument to start-ups. Work environment in start-ups is not constant, so start-ups heterogeneous experience to its employees depending on the phase of the start-up. Attributes of firm like financial capital, social capital, and organizational structure constitute workplace context. Career theory literature underscores the impact of workplace context on career path of individuals (Chattopadhyay and Choudhury 2017; Bidwell and Briscoe 2010) both within an organization and also across organizations. In case of workplace context, prior studies provide empirical evidence that size, peer group attributes, task characteristics have an influence on employee career path. Small firms (Elfenbein et. al., 2010), workplace peers (Nanda and Sørensen 2010) are found to be important factors that influence entry to entrepreneurship.

Transition to entrepreneurship also depends on the organizational role of individuals in a firm (Dobrev and Barnett 2005), founders and employees have different rates of entering entrepreneurship. I look at how characteristics of workplace context, early or late phase of start-up interact with individual employee attributes like prior experience and organizational roles in the start-up to determine entry of individuals to entrepreneurship. I do so by combining insights from organization life-cycle theories that provide evidence to dynamic workplace environment in startups and employee entrepreneurship literature. In this study, I explore if entry to entrepreneurship is contingent upon the type of role that employees work in, whether managerial or functional roles.

For this study, I use a novel individual level dataset of Indian consumer digital start-ups constructed entirely using publicly available data. This data comprises of fine-grained employee career histories of those individuals who held a job in Indian consumer digital start-ups at least once during their work life.

Theoretical Background & Hypotheses

Let us consider two employees A and B with similar human capital and risk attitude, say 'A' joins a startup 'S1' as an employee in the fourth quarter after setting up the startup while 'B' joins a startup 'S2' as an employee after four years of setting up the startup. A and B, who have similar prior human capital chose to join startups S1 & S2 and hold the same job title, 'programmer'. S1 and S2 are also very similar except the time of founding. S1 is younger than S2, while S1 is close to being a year old, S2 just turned four years old. I am interested to see if career path of A will be different to that of B even though they have similar human capital prior to joining similar startups S1 and S2 respectively.

Assume S1 and S2 are e-commerce firms that sell books online. S1 is in an exploration phase where A (who has job title as 'programmer') handles sales, computer programming and checking the inventory of the firm. In S2, B (who has job title as 'programmer') takes care of a specific problem of dealing with migration of their data in order to handle anticipated sales volumes as their management team is trying to expand the categories that S2 will sell through their website in the future. The theory of entrepreneurship put forth by (Lazear 2005) highlights the jack-of-all-trades skill mechanism where in this context A gains multiple skills owing to the initial phase of S1, whereas B specializes further. In this case, I propose to test if A is more likely to enter entrepreneurship compared to B. Current discussion

also draws insights from refined human capital theory that treats all human capital as general with firms placing different weights on the skills (Lazear 2009). S1 lays slightly lower emphasis on the programming skills of A and with work experience in S1, A gains some firm specific human capital that is pertaining to sales and process building. Whereas, in startup S2 employee B gets more specialized in programming and I expect this to contribute to the difference in the career path that A chooses from B.

At any point in time, A & B have three options, stay with the current employer, transition to another employer and founding another start-up. In this study, I am interested in exploring which employees choose one path over the other. Workplace context is different for A & B, i.e., A has exposure to early phase of start-up and B has exposure to late phase of a start-up. This difference in workplace context leads to differences in human capital developed by A & B during their work in S1 & S2 respectively.

Individual preferences and selection

In most of the studies that look at entrepreneurial entry, self-selection of employees is an empirically challenging issue that needs to be addressed. There are both selection and sorting effects that come into play when addressing individual decisions regarding entry to entrepreneurship. Ideal setup would be a scenario where employees are randomly assigned to start-ups at early phases and later mature phases. But, this is not the case in current setup and there is selection of employees into start-ups and start-ups selecting employees. Employees who are more entrepreneurial or have entrepreneurial traits, select themselves into being part of entrepreneurial environment. In the current study, employees who

join early on might have different entrepreneurial orientation compared to those employees who join the start-up at a later, more mature phase.

Descriptive model discussed above in previous section, refers to pure workplace context effects on employment mobility decision of individual. But, individual preferences play a major role as employees self-select to join a start-up. Prior studies show clearly the effect of selection and sorting on entry to entrepreneurship. (Roach and Sauermann 2015a) introduced joiners as new type of entrepreneurial actors, those individuals who have interests in common with a founder but do not want to be founders themselves. Their study provides evidence to strong ex-ante preferences to join a start-up. In that case, all start-up employees were considered the same. Other studies who also look at start-up employees bundle all of them as joiners with preferences to work in a start-up. In this study, by considering the timing of joining a start-up, I attempt to understand heterogeneity among start-up employees. In this case, those employees who join early on can have stronger joiner preferences compared to those employees who enter the start-up at later more mature phases. In a follow-up study¹³ to (Roach and Sauermann 2015a), they look at employment choice of these individuals and find that not all employees who had ex-ante joiner preferences end up in start-ups and many of them joined established firms, while on the other hand, start-ups employed people with established firm preferences.

Studies setup in contexts where there is no random assignment of employees used alternative empirical methods to deal with selection bias. These are two sided matching

13 Preliminary draft of (Roach & Sauermann, 2017) 'The Entrepreneurial Workforce: Ex ante career preferences and sorting into startup employment'.

methods (Mindruta et. al., 2016) and multi-level mixed methods (Rocha and Van Praag 2016). Since joining a start-up, is a mutual decision, where both individual and start-up consent are required, two-sided matching model can capture such situations. Multi-level mixed-effects models combine features of both fixed and random effect estimators.

Workplace Context: Early versus late phases of start-up

Workplace context in this study refers to phase of startup. Start-up is a dynamic entity that undergoes change over time. We can broadly classify different phases that start-ups go through as existence, survival, growth and take-off¹⁴. These stages can also be explained in terms of two major transformations (Rajan 2012), differentiation and standardization. Start-ups are newly created ventures that face two challenges in order to create value, differentiation in the short-term and standardization in the long-term. Differentiation could be in creating new products or product varieties that nobody else manufactures, in developing production methods that are more efficient than that of the competition, or in targeting customer populations or needs that have been overlooked. Standardization is the process of reducing the idiosyncrasy of the firm and making the resources more replaceable and hence growing to be a more established firm (Rajan, 2012). These transitional phases occur as the start-ups mature. The initial phases of existence and survival are those synonymous with the founder. The early phases of startups refer to the differentiation phase. Effectuation is defined as a human decision making process, in the context of start-ups it is the logic of the founder making minimal decisions. Since the initial phase is synonymous to the founder and he is the sole decision maker prior to having any formal organizational structure in place, initial phases can be

¹⁴ “The Five Stages of Small Business Growth”, *Harvard Business Review*, 1987

compared to the effectuation phases referred to in entrepreneurship literature (Sarasvathy 2001). The underlying aspect of this early phase is flexibility. (Davis et. al., 2009). This early phase of start-up offers a flexible workplace environment. There is no formal structure in the organization and no well-developed routines, which is often considered as flexibility in organization literature.

Transition to entrepreneurship

Workplace context helps individuals develop their human capital that influences their decision regarding next step in their career. In an early phase context, employees are likely to have opportunities to gain broad set of skills compared to more specialized and focused issues in the later phases. These broader set of skills are important for entrepreneurship (Lazear 2009). Since this early phase is devoted to exploration, employees in the start-up get a chance to have hands-on learning experience in identifying market opportunities, building processes from the scratch and surviving in resource-constrained environments. In addition, since there is no formal organizational structure, there are no constraints imposed on actions of the employee. This allows employee to gain expertise in handling tasks with greater autonomy. But, as the organization grows older, irrespective of whether there is an increase in growth in terms of size or not, there will be some routines that get established owing to the age of the firm. These routines need not be good routines that enhance firm productivity or bad routines that cause inertia. However, they lead to differences in workplace environment when compared to a young firm with same age. One example of a case where we can see smaller but older firm can be a firm that was not able to scale-up owing to path-dependencies of growth from the initial phases. Another example is where the founder did not want to give up control and chose not to scale-up the firm. It is difficult to disentangle the effects of organizational age and size. Say, we take

an example of two similar start-ups; one is four-month-old start-up and other four-year-old start-up, both with 5 employees. Both these start-ups will give their employees similar size advantages, but they differ in terms of age advantages. Here, the differences could arise in terms of task distribution of employees and the degree of exploration in start-up. Experimentation can be more aggressive in the younger start-up compared to the older start-up that did not scale-up although it is much older. Also, due to the differences in the type of human capital required by the firm in the initial year versus the later year will give rise to the difference in the type of network that employees gets exposure to. In the younger start-up it could be that, the network that the employees are exposed to is much wider whereas in the older start-up the network that the employees are exposed to will be much narrower considering that there might have been some churn which kept the size of the firm smaller. In such case, exploration in the start-up, close proximity to founding team and exposure to wider network are the aspects that differentiate the workplace context experienced by an employee who is exposed to early phase from employee exposed to later phase of start-up. In this regard, I hypothesize the following

Hypothesis 1:

Employees exposed to 'early phases' of start-up are more likely to enter entrepreneurship compared to employees exposed to later phases of start-up.

Transition to another employer

Employee mobility literature provides insights regarding employee transition from their current employment. Exit decisions of employees has been examined in many contexts and factors like status of firm (Campbell et. al., 2012), complementary assets provided by the firm had a significant impact on employees' mobility decisions. In most cases, it was the exit of

employees working in an established firm examined. This research addresses and underscores the need for observing mobility of their human capital which is a major source of firms' competitive advantage (Coff 2015).

Early phase of start-up provides a different set of complementary assets to an employee compared to later phase exposure. Complementary assets provided by the firm include resources and capabilities embodied in human capital, routines, opportunities, physical assets, intellectual property etc.(Campbell et.al., 2012). During early phases of start-up, employees invest effort in activities that are broader than those revealed by their job titles. Early exposure to start-up environment will help employees and start-up generate co-specialized human capital. If two assets create more value when combined than individually, then they are co-specialized assets (Teece 1986). Employees hired in early phases invest their effort in learning new technologies and processes that are uniquely valuable in their job context but might be very helpful outside their current job. For example, in initial phases, start-ups usually tend not to invest heavily in paid software services and opt for open source softwares. This is because they are in experimentation phase and are experimenting with their product or service ideas. Therefore, they might take time to understand their technical or managerial needs better before settling down with a specific offering available on the market. In addition, they are financially constrained. However, managing such open source softwares comes with a cost of employee time and effort. Employees have to dedicate time to gain skills in a particular context of specific open source technologies. These skills may not be transferable and are uniquely valuable in their start-up job context. The same example of open source software that differentiates a flexible early phase of start-up to that of later mature phases helps explain skills developed by employee while exposed to early phases. Employee gains proficiency in a software that is most

likely not used by other established firms where he can move to, thereby limiting outside opportunities for the employee. In such a case, employee will be less likely to transition to another employer. This set of skills and experience that she gained in the early phases of start-up are less transferable to another firm and hence he is less likely to go to another employer. In this case, I hypothesize as follows,

Hypothesis 2:

Employees exposed to 'early phases' of start-up are more likely to enter entrepreneurship compared to leaving to another employer.

Prior Experience and transition

Experience provides more information to an individual for decision-making. Prior experience gives individuals tacit knowledge that can be gained only through learning on the job. Such knowledge shapes how individuals process information and pay attention to cues they receive on their current job (Hitt et al. 2001). Individuals who have prior experience have more information regarding their fit for the current job and this shapes preferences for their next transition. Prior studies provide valuable insights of influence of experience on founders' exit decisions (Arora and Nandkumar 2011). Less is known about mobility decisions of early employees. Similar to founders, employees exposed to early phases of start-up can also evaluate outside opportunities better owing to their experience outside this current employment in a start-up. In case of employees who join the start-up early on and have some work experience before joining this start-up, they have more information regarding their skills and fit.

In such case, when employees have prior experience before joining the start-up, their choice of joining the start-up is influenced by their prior learning. Since they made their first choice of joining of start-up at a later phase of career and not the very beginning, they tend to spend more time in start-up in order to decide to make the next transition. This is because their prior experience can help shape their learning in a flexible environment. In the early phases of the firm, when there is more flexibility both in terms of decision making and task structure, those employees with prior experience have more ability to handle uncertainty. In this context, I hypothesize the following:

Hypothesis 3:

Prior experience negatively moderates the relationship between early exposure and likelihood to exit to founding team.

Hypothesis 4:

Prior experience negatively moderates the relationship between early exposure and likelihood to exit to another employer.

Organizational roles and transition to entrepreneurship

Employees occupy roles in an organization. Roles and positions are fundamental building blocks of an organization (M. D. Burton and Beckman 2007). Roles are more abstract and broad notion compared to positions. Roles represent the bundle of tasks and responsibilities associated with positions. Creating positions is a strategic choice of the firm, but roles exist since the tasks are spread out irrespective of whether there is a hierarchical or vertical structure existing in the firm yet or not. (Dobrev and Barnett 2005) discuss the difference in entry rate

to entrepreneurship by the role of an individual as founder or member of an organization. Evidence from (Dobrev and Barnett 2005) suggests that interaction between roles occupied by individual in an organization and properties of organizations predicts entry to entrepreneurship. They find that entry to entrepreneurship monotonically decreases with organization age and size for individuals who hold the role of members in the organization. In this study, by focusing on employees alone, I further investigate the transitions to entrepreneurship based on nature of job roles, managerial or functional. Managerial roles are those that contribute to managerial capabilities of the firm and functional roles contribute to functional capabilities. Managerial capabilities are processes associated with the integration and coordination of firm resources and activities. Functional capabilities are processes associated with the day-to-day operational activities of the firm related to the production of products and services (Fortune and Mitchell 2012). Resource based theory emphasizes on human capital contributing to capabilities of firm. Human capital is the key asset to the organization and this asset builds capabilities (Teece et. al., 1997). This classification of managerial and functional capabilities is broad and captures the essence of roles within the organization (Fortune and Mitchell 2012). I follow classification from prior literature (Fortune and Mitchell 2012) in order to code managerial and functional roles. Managerial roles are those that have job titles associated with strategy, human resources, finance and legal. Functional roles are those that have job titles associated with production, marketing/sales, engineering, research and development.

I revisit the concept of capability to understand as to when roles attain significance in a firm. Not all activities or roles contribute to capabilities of the firm. Concept of capabilities can be viewed as a set of routines and this implies that in order for performance of certain activities by individuals having an organizational role, these activities must reach a certain threshold

level of routines (Helfat and Peteraf 2003). This signifies that it takes certain time for activities to transform to capabilities of a firm. Which means, even though firms have same roles, both in terms of quality (i.e., similar human capital) and quantity (i.e., same size) at say, organizational age of four months and four years, only those that exist at the age of four years contribute to capabilities owing to the time taken for formation of routines.

Employees can either hold managerial or functional roles. During the early phases of the firm, the firm is small and tasks handled by employees in both functional and managerial roles span beyond their job titles (Fortune and Mitchell 2012). Job titles given to employees reveal which role they hold in the start-up. Lazear's theory of entrepreneurship (Lazear 2005) portrays entrepreneurs as jack-of-all-trades and in such case; their job title should not restrict them to a specific task and not bar them from gaining skills beyond what their job title says. In such case, when employees are early hires, I do not expect organizational role to be a key factor that predicts entry to entrepreneurship. Prior study about spawning in medical device industry (Chatterji 2009), gives us insights about how employees in medical device industry entered entrepreneurship. Employees gained market information and hands-on learning experience to identify opportunities in case of medical device industry that played a key role in successful transition to entering entrepreneurship. This example would be true in case of early hires since all employees in this phase gain exposure to overall working of start-up without any compartmentalized information, as there is no division of departments during that phase.

However, as the start-up ages these practices change and work becomes more segregated and organizational roles start playing a dominant role. In case of late exposure to start-up, organizational roles are an important factor in predicting the next career move choice

of the individual. Employees exposed to later phases of start-up and occupying managerial roles are those who are involved in exploitation or standardization phases of start-up and hence are those who primarily focus on efficiency enhancement of processes. Therefore, in case they leave they will be more likely to leave to other employer owing to the skills they develop in case of process building and in a start-up environment but during later phases when the challenges get closer to those faced by an established firm. I hypothesize as below.

Hypothesis 5:

Managerial Employees exposed to later phases of the firm will be less likely to exit to entrepreneurship compared to leaving to other employers.

Context & Data

Context: Consumer Digital Start-ups in India

The context of the study is consumer digital startups or internet based startups in India founded during 2004-2013. I use a linked employee-employer dataset constructed entirely using publicly available information on internet. Detailed description of dataset can be found in chapter 2. This study is at an employee level and employee-firm is the unit of analysis. This context provides an opportunity to explore emerging market with large IT labor market.

Sample of employees used for this study consists of 134,858 employees. This is after cleaning the data. Employee data consists of joining time, leaving time, job title, job description, company names and educational qualifications. Employees who do not report joining time or leaving time are not included in this study.

In case of managerial and functional roles. After classifying employees to managerial and functional using job titles, the number of employees is 74,684. This is because of missing job title data and overlap of managerial and functional roles. Only those employees whose job title is clearly classified are included in analyses with organizational role variable. Other employees have both managerial and functional roles, so they are set aside in analysis.

Measures & Methods

Dependent Variable:

Employee transition to become entrepreneurs or to other firms is the dependent variable. This variable is 'transition'.

Transition – There are three possible scenarios for every employee. Staying within the current firm, moving to a different startup as a founding team member and moving to another employer.

The dependent variable is transition variable that takes a value of 1 if the employee stays in the startup and does not make a transition to either another startup or another employer.

The dependent variable is transition variable that takes a value of 2 if the employee transitions to another startup as a founding team member.

Transition variable takes a value of 3 if employee transitions to another employer. This is mobility to another job.

I use job titles reported by employees are to code transition. In this case, I do not have to make any assumptions as to who is a founding team member or not. Job titles that say founder or co-founder are clearly founding team members. This is one of the key advantages of this

dataset as there is no ambiguity concerning employee job titles. The transition can be immediate or anytime later as observed in the data. Prior literature measures this within a window of two years of transition from the firm (Elfenbein, Hamilton, and Zenger 2010). Although in the results presented in the current study this variable is measured in the period of data availability, which is both within and beyond two years of the transition.

Independent & Control Variables:

Age of start-up - this is the age of start-up (in years) at the time when employee joins the start-up. This is a continuous measure.

Early exposure – This is a dummy variable that takes a value of 1 if the employee/joiner has joined the startup within a year (more precisely, first four quarters after setting up the website) of its founding and takes a value of 0 for all other employees who are the later phase employees.

Experienced – This is a dummy variable that takes the value of 1 if the employee held any other jobs prior to joining the current startup. In all other cases, the variable takes a value of 0.

Prior number of jobs held (Prior Jobs) – The number of jobs that an employee held prior to joining the startup is taken into account. This variable shall take into account the number of career transitions that an individual underwent prior to joining the startup. Although this measure gives one aspect of experience, it does not completely reveal the nature of experience. The individuals with greater number of jobs could be different from those with less number of jobs but equivalent experience in terms of amount of time.

Managerial role - Takes a value of 1 for roles contributing to managerial capabilities of firm and 0 for those roles contributing to functional capabilities. Managerial roles are those that have job titles associated with strategy, human resources, finance and legal. Functional roles are those that have job titles associated with production, marketing/sales, engineering, research and development. Titles are coded irrespective of positions. C-level or VP level or manager level employee is considered to have a managerial role if say his job title say finance department, i.e, CFO (Chief Financial Officer) or VP (Vice President) – Finance or Assistant manager – Finance, all of them have managerial role.

Education variables – The highest level of education of an individual is included. A dummy variable for each level of education, PhD, masters and bachelors is included if it their highest level of education.

Controls for the type of education are also included. Engineering, Commerce and MBA are three dummy variables that take values of 1 if the individual has education in respective fields. In other cases the variables take a value of 0.

Size of start-up – size of start-up is measured using number of employees. Size in year t is the average number of employees in start-up in all quarters in year t. Say, there is one employee in for four quarters in a year, then size takes a value of 0.25

I use competing risks analysis. Every employee has three alternatives, stay in the current job, and leave to another employer or leave to setup another start-up.

Results

I first look at how age of start-up at the time of joining influences entry to entrepreneurship. I also present results using dichotomized variable of exposure to start-up as dependent variable. Descriptive statistics for all employees are provided in Table 4. 1. It can be seen that 0.6% percent of employees in the sample enter entrepreneurship and 50% of employees move to another employer after their stint in the start-up. 7.3% of all employees have exposure to early phase of start-up. Of all employees who have early phase exposure, 73% of them enter entrepreneurship and 5.7% of them move to another employer.

Considering employees who join within the first four quarters of setting up the start-up as those employees exposed to ‘early’ phases of start-up and others as ‘later’ phases of start-up, Table 4. 2 and Table 4. 3 provide descriptive statistics for early and later employees. Mean of transition of early employees is .06 while that for later employees is 0.002. While mean of transition to another employer for early employees is 0.396 and that for later employees is 0.516. it is interesting to note that there is not much of a difference in managerial roles held by employees exposed to early or later phases of the start-up.

 Table 4. 1 , Table 4. 2 & Table 4. 3 about here

In Table 4. 4, results of competing risks regression where failure is exit to being a founding team member of new start-up, are presented. This exit to founding team member is entry to entrepreneurship. The competing option for an employee is to exit to another

employer. Year fixed effects are included in all models. In model (1) , controls for education and prior founding experience are included. In model (2), in addition to education and prior founding experience, size of start-up is also included. In model (3) & (4), managerial roles variable and interaction of managerial variable with age of start-up respectively are included.

In Table 4. 4, in all models (1) - (4), the coefficient of age of start-up is negative and significant. As start-up grows older, it is less likely that an employee transitions to being a founding team member. Age of start-up is the age of start-up at time of joining of individual, which implies that greater the age of start-up at time of joining of individual, less likely is he to enter entrepreneurship. If the individual joins the start-up at later mature phases, he is less likely to become a future entrepreneur. Similarly, employees who join the start-up when the start-up is young are more likely to be future founding team members or enter entrepreneurship. The baseline of these models is staying with the current employer. So, the coefficients signify that if employees join the start-up when the age of the start-up is greater by one year, then they are 0.95 times less likely to enter entrepreneurship compared to staying with the current firm. Also, models (3) & (4) are consistent with (1) & (2). In model (2), size variable has been included and size of the start-up at the time of joining is not significant. In model (3) & (4), size variable is negative and significant at 10 percent level, however the coefficient is very small. In all the models, prior founding/entrepreneurial experience of an individual are controlled for and this has a large negative and significant effect on entrepreneurial entry of an individual.

This provides support to hypothesis 1 that employees who join the start-up when the start-up is young are more likely to enter entrepreneurship compared to those employees who

join the start-up when the start-up is in a more mature phase.

 Table 4. 4 about here

In Table 4. 5, I present results similar to those in Table 4. 4. Results of competing risks regression of entrepreneurial entry with transition to another employer as competing option are presented. Early exposure variable is a binary variable that takes a value of 0 or 1. It takes a value of 1 when age of start-up when employee joins the start-up is less than or equal to four quarters and 0 otherwise. Coefficient of early exposure variable is consistently positive and strongly significant across all models (1) – (4). Employees who have exposure to early phases of the firm are more likely to enter entrepreneurship compared to those employees who do not have exposure to early phases of start-up.

In models (2) – (4) start-up size variable, size at the time of individual joining the start-up has been included. In model (2), coefficient of size variable is not significant. In model (3) & (4), coefficient of size variable is negative and significant at 0.5 percent level, however the coefficient is very small. In all the models, prior entrepreneurial experience of an individual are controlled for and this has a large negative and significant effect on entrepreneurial entry of an individual. Year fixed effects are included in all models.

 Table 4. 5 about here

Next, I look at how age of start-up at the time of joining influences exit of employee to another employer. In

Table 4. 6, results of competing risks regression where failure is exit to another employer while entry to entrepreneurship is the competing option, are presented. Age of start-up at the time of joining is the dependent variable. In model (1) & (2), coefficient of age of start-up at the time of joining is positive and significant. Older the firm when the individual joins, the more likely he is to transition to another employer compared to staying with the current start-up.

 Table 4. 6 about here

In Table 4.7, results of competing risk regression with exit to another employer as failure and exit to another employer as competing option are presented. Early exposure is the independent variable. All models (1) - (4) have year fixed effects. Coefficient of early exposure variable from models (1) – (4) is consistently negative and significant. This suggests that employees exposed to early phases of the firm are less likely to exit to another employer compared to those employees not exposed to early phases of the firm. In models (2) – (4), size of start-up at the time of joining of individual is included in analysis and the coefficient is negative and significant. However, the value of coefficient is very small and nearly negligible.

Table 4.7 about here

I next look at how prior experience of an individual moderates the relationship between the phase of start-up at the time of joining and risk of exit to founding team. In table 4.6, results of competing risks regression with exit to founding team as failure and exit to another employer as competing event are presented. Start-up age at the time of joining is the independent variable. All models (1) - (3) have year fixed effects. In model (2), prior experience variable is included and in model (3) results of interaction between prior experience and start-up age are presented. Coefficient of start-up age is negative and significant, which is consistent with results discussed previously in table 4.2. Coefficient of prior experience of an individual is positive and significant in all models (1) – (3). As prior experience increases, employees are more likely to transition to founding team members than staying at the current firm. Coefficient of prior experience variable in model (2) suggests that increase in one job held prior to joining the start-up increases the risk of exit of an employee to a founding team member by 25.2%. Size of the start-up at the time of joining is included in all models (1) – (3) and is not significant in models (2) & (3).

Table 4. 8 about here

Similarly, Table 4. 9, where early exposure variable is the independent variable, coefficient of prior experience is positive and significant. Also the value of coefficient of prior experience variable is the same as that in Table 4. 8. In Table 4. 9, coefficient of interaction between early exposure and prior experience is negative and significant. As prior experience increases for employees exposed to early phases of the firm, lower is the risk of exit to being founding team members. For an employee who is exposed to early phases of the start-up, increase in one job held prior to joining the start-up lowers the risk of entering entrepreneurship by 6.9%. Size of the start-up at the time of joining is included in all models (1) – (3) and is not significant in models (2) & (3).

 Table 4. 9 about here

Next, I look at transition to another employer and prior experience as a moderator. In table 4.8, I present results of competing risk analysis with exit to another employer as a failure and entry to entrepreneurship as a competing option. All models have year fixed effects. Age of start-up at the time of employee joining is the independent variable. In model (1) & (2), prior experience coefficient is positive and significant. But the size of coefficients is much lower than those compared to those in table 4.6. An increase in one job prior to joining the start-up increases risk of exit to another employer by 3.7% compared to staying in current firm unlike 25.2% increase in risk of exit to being a founding team member compared to staying in current firm. Size of the start-up at the time of joining is included in all models (1) – (3) and is significant but the coefficient is very small.

 Table 4. 10 about here

In Table 4. 11, I present results of competing risk analysis with exit to another employer as a failure and entry to entrepreneurship as a competing option. All models have year fixed effects. Early exposure, binary variable is the independent variable. Results are similar to those in Table 4. 10. Coefficient of interaction between early exposure variable and prior experience is negative and significant. With an additional job before joining the start-up, employee exposed to early phase of start-up will be at $(+0.048-0.085)*100\% = 3.7\%$ more risk of exiting to another employer. Whereas, an employee who is not exposed to early phase of the firm is 4.8% more likely to exit to another employer. In all models, size of start-up at the time of joining is included and is negative and significant but the coefficient is very small.

 Table 4. 11 about here

Now, I look at organizational roles and employee transition. I shall revisit initially discussed tables 4.4-4.6. In Table 4. 4, model (3), managerial variable is positive and significant, i.e., managerial employees are 0.34 times more likely to transition to founding teams than staying in the current job. However, when interacted with age of the start-up when the employees joined the firm, no such effect exists. I do not find support for hypothesis 5.

Coefficient of managerial role is included in Table 4.6, model (3). In this case, the coefficient of age of start-up at the time of joining is no more significant and the coefficient of managerial role is negative and significant. Employees holding managerial roles are less likely to transition to another employer compared to staying in the firm. This means that employees holding functional roles are more likely to transition to another employer. In model (4), interaction effect between managerial roles and age of start-up can be observed. Joining an older start-up for employees holding managerial roles increases the chances of transitioning to another employer. The net effect of transition to another employer is negative and significant.

Discussion

In this study, I focus upon workplace context of start-ups and observe that they also are places that provide environment where employees can learn about their fit for entrepreneurship. Employees exposed to early phases of career are more likely to enter entrepreneurship compared to employees those exposed to later phases of career. Panel data with individual fixed effects will alleviate concerns of individual preferences. However, in this study since I use cross-sectional data at an individual and start-up level, I cannot delineate the effects of individual preferences.

An alternate way to provide additional robustness to check if it is managerial knowledge that aids employees to enter entrepreneurship, is to consider roles of prior experience of employees. If these effects persist in employees who transition from functional roles to managerial roles, then it can provide us with additional evidence that it is managerial knowledge that drives them to enter entrepreneurship.

Information technology and managerial employee divide is one major aspect that needs more attention in the current study. Prior studies either considered only information technology workers (Bidwell & Briscoe, 2010) or only managerial employees (Honoré & Ganco, 2016). Dataset used in the current study includes all employees, both information technology and managerial, which makes it insightful worthy to observe the distinct career paths of both types of employees.

I did not include gender and sector (industrial sectors that these internet based firms cater to) control variables in current study. Health of the startup i.e., whether the employees made a transition from a successful versus failed startup is not considered in this study. I shall include it in as part of my future work.

Table 4. 1: Descriptive Statistics (for all employees)

	VARIABLES	N	mean	sd	min	max
1	Transition to Entrepreneurship	134858	0.006	0.077	0	1
2	Transition to Other Employer	134858	0.507	0.500	0	1
3	Age of Start-up	134858	4.567	2.397	1	11
4	Early Exposure	134858	0.073	0.261	0	1
5	Managerial	75450	0.325	0.468	0	1
6	Prior Experience (#Jobs)	134858	1.522	1.753	0	33
7	Highest_Bachelor	134858	0.357	0.479	0	1
8	Highest_Master	134858	0.300	0.458	0	1
9	Highest_PHD	134858	0.001	0.028	0	1
10	MBA	134858	0.150	0.357	0	1
11	Prior Entrepreneurial Experience	134858	0.005	0.069	0	1
12	year	134858	2011.8	1.940	2004	2014

Table 4. 2: Descriptive statistics for employees exposed to ‘EARLY’ phases of the firm

VARIABLES	N	mean	sd	min	max
Transition to Entrepreneurship	9875	0.060	0.237	0	1
Transition to Other Employer	9875	0.396	0.489	0	1
Age of Start-up	9875	1	0	1	1
Managerial	4647	0.327	0.469	0	1
Prior Experience (#Jobs)	9875	1.666	1.948	0	15
Highest_Bachelor	9875	0.341	0.474	0	1
Highest_Master	9875	0.271	0.445	0	1
Highest_PHD	9875	0.003	0.050	0	1
MBA	9875	0.129	0.335	0	1
Prior Entrepreneurial Experience	9875	0.057	0.231	0	1
year	9875	2010.375	2.296	2004	2013

Table 4. 3: Descriptive statistics for employees exposed to ‘LATER’ phases of the firm

VARIABLES	N	mean	sd	min	max
Transition to Entrepreneurship	124983	0.002	0.041	0	1
Transition to Other Employer	124983	0.516	0.500	0	1
Age of Start-up	124983	4.849	2.261	1	11
Managerial	70803	0.325	0.468	0	1
Prior Experience (#Jobs)	124983	1.511	1.736	0	33
Highest_Bachelor	124983	0.359	0.480	0	1
Highest_Master	124983	0.302	0.459	0	1
Highest_PHD	124983	0.001	0.026	0	1
MBA	124983	0.152	0.359	0	1
Prior Entrepreneurial Experience	124983	0.001	0.025	0	1
year	124983	2011.954	1.861	2005	2014

Correlation Matrix (for all employees)

	VARIABLES	1	2	3	4	5	6
1	Transition to Entrepreneurship	1					
2	Transition to Other Employer	-0.078	1				
3	Age of Start-up	-0.092	-0.083	1			
4	Early Exposure	0.197	-0.063	-0.418	1		
5	Managerial	0.010	-0.039	0.046	0.001	1	
6	Prior Experience (#Jobs)	0.064	0.026	0.082	0.023	0.098	1
7	Highest_Bachelor	0.001	0.052	0.024	-0.010	-0.098	0.013
8	Highest_Master	0.001	0.092	0.022	-0.018	0.081	0.104
9	Highest_PHD	0.012	0.002	-0.007	0.017	0.013	0.027
10	MBA	-0.002	0.065	0.039	-0.017	0.280	0.120
11	Prior Entrepreneurial Experience	-0.005	-0.028	-0.094	0.213	0.010	0.098
12	year	-0.065	-0.252	0.413	-0.212	-0.031	0.148

	VARIABLES	7	8	9	10	11	12
7	Highest_Bachelor	1					
8	Highest_Master	-0.488	1				
9	Highest_PHD	-0.021	-0.018	1			
10	MBA	-0.314	0.642	0.003	1		
11	Prior Entrepreneurial Experience	0.011	-0.004	0.010	0.000	1	
12	year	0.112	-0.005	-0.017	0.009	-0.026	1

Table 4. 4: Competing Risks regression of entrepreneurial entry with transition to another employer as competing option

Age of start-up at joining as independent variable

VARIABLES	(1) Founding Team	(2) Founding Team	(3) Founding Team	(4) Founding Team
Start-up Age	-0.948*** (0.056)	-0.949*** (0.064)	-0.894*** (0.110)	-0.949*** (0.146)
Managerial			0.338** (0.138)	0.104 (0.390)
Managerial* Start-up Age				0.139 (0.217)
Highest_Bachelor	0.309*** (0.087)	0.309*** (0.087)	0.323** (0.153)	0.326** (0.154)
Highest_Master	0.310*** (0.106)	0.310*** (0.107)	0.110 (0.199)	0.114 (0.200)
Highest_PHD	0.984* (0.544)	0.984* (0.544)	0.933 (0.959)	0.970 (0.961)
MBA	-0.026 (0.126)	-0.026 (0.127)	0.176 (0.251)	0.167 (0.251)
Prior Entrepreneurial Experience size	-17.508*** (0.071)	-17.509*** (0.071)	-15.278*** (0.145)	-15.257*** (0.145)
		0.000 (0.001)	-0.006* (0.003)	-0.006* (0.003)
Observations	133,351	133,351	74,684	74,684
Year FE	Y	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 5: Competing Risks regression of entrepreneurial entry with transition to another employer as competing option

Early exposure as independent variable

VARIABLES	(1) Founding Team	(2) Founding Team	(3) Founding Team	(4) Founding Team
Early exposure	3.427*** (0.089)	3.291*** (0.129)	3.418*** (0.177)	3.456*** (0.209)
Managerial			0.286** (0.136)	0.369 (0.274)
Early exposure*Managerial				-0.106 (0.304)
Highest_Bachelor	0.330*** (0.087)	0.324*** (0.087)	0.338** (0.153)	0.338** (0.153)
Highest_Master	0.370*** (0.106)	0.354*** (0.107)	0.164 (0.199)	0.166 (0.199)
Highest_PHD	0.719 (0.529)	0.708 (0.529)	0.380 (0.960)	0.391 (0.960)
MBA	-0.092 (0.127)	-0.066 (0.128)	0.147 (0.249)	0.143 (0.249)
Prior Entrepreneurial Experience size	-20.381*** (0.064)	-20.405*** (0.064)	-22.143*** (0.125)	-22.159*** (0.125)
		-0.002 (0.002)	-0.006** (0.003)	-0.006** (0.003)
Observations	133,351	133,351	74,684	74,684
Year FE	Y	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 6: Competing Risks regression of transition to another employer with entrepreneurial entry as competing option.

VARIABLES	(1) Other Employer	(2) Other Employer	(3) Other Employer	(4) Other Employer
Start-up Age	0.020*** (0.002)	0.027*** (0.002)	-0.000 (0.003)	-0.009*** (0.003)
Managerial			-0.160*** (0.012)	-0.282*** (0.024)
Managerial* Start-up Age				0.029*** (0.005)
Highest_Bachelor	0.558*** (0.010)	0.556*** (0.010)	0.555*** (0.013)	0.556*** (0.013)
Highest_Master	0.557*** (0.012)	0.549*** (0.012)	0.540*** (0.015)	0.541*** (0.015)
Highest_PHD	0.273** (0.137)	0.270** (0.136)	0.436** (0.208)	0.461** (0.205)
MBA	0.064*** (0.013)	0.074*** (0.013)	0.149*** (0.019)	0.144*** (0.019)
Prior Entrepreneurial Experience size	-0.841*** (0.069)	-0.835*** (0.069)	-0.469*** (0.119)	-0.457*** (0.119)
		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Observations	133,351	133,351	74,684	74,684
Year FE	Y	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.7: Competing Risks regression of transition to another employer with entrepreneurial entry as competing option.

Early exposure as independent variable

VARIABLES	(1) Other Employer	(2) Other Employer	(3) Other Employer	(4) Other Employer
Early exposure	-0.649*** (0.017)	-0.660*** (0.017)	-0.426*** (0.022)	-0.310*** (0.025)
Managerial			-0.158*** (0.012)	-0.134*** (0.012)
Early exposure * Managerial				-0.399*** (0.049)
Highest_Bachelor	0.561*** (0.010)	0.559*** (0.010)	0.556*** (0.013)	0.557*** (0.013)
Highest_Master	0.557*** (0.012)	0.549*** (0.012)	0.536*** (0.015)	0.538*** (0.015)
Highest_PHD	0.365*** (0.134)	0.362*** (0.133)	0.572*** (0.190)	0.642*** (0.183)
MBA	0.065*** (0.013)	0.076*** (0.013)	0.149*** (0.019)	0.144*** (0.019)
Prior Entrepreneurial Experience size	-0.399*** (0.070)	-0.402*** (0.070)	-0.149 (0.121)	-0.113 (0.120)
		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Observations	133,351	133,351	74,684	74,684
Year FE	Y	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 8: Competing risks regression with prior experience as moderator.

VARIABLES	(1) Founding Team	(2) Founding Team	(3) Founding Team
Start-up Age		-0.918*** (0.065)	-1.038*** (0.070)
Prior Experience	0.266*** (0.014)	0.252*** (0.014)	0.159*** (0.030)
Start-up Age*Prior Experience			0.037*** (0.012)
Highest_Bachelor	0.242*** (0.091)	0.243*** (0.089)	0.254*** (0.091)
Highest_Master	0.170 (0.111)	0.221** (0.108)	0.236** (0.110)
Highest_PHD	0.805 (0.527)	0.746 (0.531)	0.775 (0.529)
MBA	-0.070 (0.132)	-0.102 (0.127)	-0.084 (0.129)
Prior Entrepreneurial Experience size	-23.186*** (0.140)	-17.548*** (0.090)	-17.368*** (0.093)
	-0.013* (0.008)	-0.000 (0.001)	-0.000 (0.001)
Observations	133,351	133,351	133,351
Year FE	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 9: Competing risks regression with prior experience as moderator.

Early exposure as independent variable.

VARIABLES	(1) Founding Team	(2) Founding Team	(3) Founding Team
Early Exposure		3.175*** (0.131)	3.371*** (0.144)
Prior Experience	0.266*** (0.014)	0.252*** (0.012)	0.277*** (0.018)
Early Exposure*Prior Experience			-0.069*** (0.023)
Highest_Bachelor	0.242*** (0.091)	0.247*** (0.088)	0.254*** (0.089)
Highest_Master	0.170 (0.111)	0.195* (0.110)	0.231** (0.110)
Highest_PHD	0.805 (0.527)	0.420 (0.532)	0.461 (0.527)
MBA	-0.070 (0.132)	-0.094 (0.129)	-0.100 (0.128)
Prior Entrepreneurial Experience size	-23.186*** (0.140)	-19.550*** (0.081)	-18.335*** (0.079)
	-0.013* (0.008)	-0.002 (0.002)	-0.002 (0.002)
Observations	133,351	133,351	133,351
Year FE	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 10: Competing risks regression with prior experience as moderator.

VARIABLES	(1) Other Employer	(2) Other Employer	(3) Other Employer
Start-up Age		0.028*** (0.002)	0.012*** (0.002)
Prior Experience	0.037*** (0.002)	0.037*** (0.002)	-0.002 (0.004)
Start-up Age* Prior Experience			0.009*** (0.001)
Highest_Bachelor	0.543*** (0.010)	0.545*** (0.010)	0.545*** (0.010)
Highest_Master	0.536*** (0.012)	0.534*** (0.012)	0.535*** (0.012)
Highest_PHD	0.195 (0.137)	0.202 (0.136)	0.206 (0.136)
MBA	0.060*** (0.013)	0.058*** (0.013)	0.056*** (0.013)
Prior Entrepreneurial Experience size	-0.999*** (0.069) -0.000*** (0.000)	-0.927*** (0.069) -0.000*** (0.000)	-0.866*** (0.070) -0.000*** (0.000)
Observations	133,351	133,351	133,351
Year FE	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. 11: Competing risks regression with prior experience as moderator.

VARIABLES	(1) Other Employer	(2) Other Employer	(3) Other Employer
Early Exposure		-0.677*** (0.017)	-0.536*** (0.022)
Prior Experience	0.037*** (0.002)	0.043*** (0.002)	0.048*** (0.002)
Early Exposure* Prior Experience			-0.085*** (0.009)
Highest_Bachelor	0.543*** (0.010)	0.546*** (0.010)	0.547*** (0.010)
Highest_Master	0.536*** (0.012)	0.533*** (0.012)	0.534*** (0.012)
Highest_PHD	0.195 (0.137)	0.284** (0.134)	0.289** (0.134)
MBA	0.060*** (0.013)	0.056*** (0.013)	0.055*** (0.013)
Prior Entrepreneurial Experience size	-0.999*** (0.069) -0.000*** (0.000)	-0.502*** (0.070) -0.000*** (0.000)	-0.375*** (0.071) -0.000*** (0.000)
Observations	133,351	133,351	133,351
Year FE	Y	Y	Y

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

CHAPTER 5: Job titles and Employee turnover in Start-ups

Abstract

Start-ups are resource-constrained entities that cannot compete with large established firms in the labor market and match pay. Their hiring strategies consist of providing non-monetary incentives like 'inflated leadership' job titles to employees. This can be eccentric roles or simple senior roles. However, it is unclear if this strategy can help them retain employees to who they provide senior titles. In this study, I ask if and under what circumstances start-ups can retain their 'leadership' employees. Taking a question based approach, and one aspect of leadership role to be senior role, I explore turnover of senior employees in start-ups.

Introduction

With advent of new technologies, like cloud computing and efficient open source softwares, cost of setting up a firm dramatically decreased (Kerr, Nanda, and Rhodes-Kropf 2014). Internet based firms do not own significant valuable physical assets. Employees are the key resource of start-ups especially when the businesses have no huge sunk costs or physical assets¹⁵. In such instance, start-ups rely upon human capital of their employees for competitive advantage. Intense labor market competition for human capital drives start-ups to adopt strategies that help them win wars for talent (Gambardella, Giarratana, and Panico 2009). Two major issues that start-ups grapple with are hiring and retention. As part of hiring and retention strategy, in order to attract talent, start-ups offer inflated job titles to its employees. The Mobile Ninja, Software Ninja, Senior Content Writer, Senior Mobile Application Developer are a few examples of titles given to employees¹⁶. However, are start-ups able to retain these employees? I focus on one type of inflated titles that is ‘senior job titles. In this study, I address turnover of employees who hold ‘senior’ job titles in start-ups and ask if senior hires of start-ups are more or less likely to exit the firm.

Start-ups vary considerably in their access to resources and stable relationships, and these variations may lead to differences in their early fates (J. A. Baum 1996; Fichman and Levinthal 1991; J. A. C. Baum, Calabrese, and Silverman 2000). Human capital is one such resource that leads to differences in productivity of firms. Quality of founding team human capital is shown to have a positive impact on start-up survival and growth. Majority of this

¹⁵ The other side of paradise (2016, January). The Economist
(<http://www.economist.com/node/21688390/print>)

¹⁶ Titles from employees of an online wallet start-up called MobiKwik.

stream of research at an individual level, focusing on founding team human capital focused on the question as to who succeeds as an entrepreneur. Start-up does not solely rely on founding team, but also on employee human capital that gives start-ups a competitive advantage against other firms. Relatively fewer studies focus on employees of these start-ups¹⁷, one example of such study that emphasizes on individuals working for start-ups is where (Sorenson, Dahl, and Burton 2015) ask if entrepreneurs create ‘good’ jobs.

Employee mobility is one of the key mechanisms through which knowledge spill-overs across firms occur (Tambe and Hitt 2013b). With increasing mobility of employees, there is a greater chance of knowledge transfer across firms. This job hopping behaviour of employees is found to increase overall firm productivity. This also comes with a cost of firms losing their competitive advantage. Although it is the human capital profile of start-ups that confers upon them a competitive advantage, owing to employee mobility this advantage is not bound to be sustainable. Therefore, start-ups need to adopt strategies in order to retain these employees. Since start-ups are yet to prove their worth, attracting talent is difficult. Even after hiring, retaining talent another challenge.

Start-ups are financially constrained. They cannot offer pay on par with the large firms that they compete with in labor market. Career theory also provides us with insights that individuals build careers across organizations. This suggests that pay alone is not sufficient in order to hire or retain people. Economic incentives literature provides evidence that non-monetary incentives like autonomy provided to employees helps to motivate them and further

17 <http://www.kauffman.org/microsites/state-of-the-field/topics/background-of-entrepreneurs/human-capital>

retain them (Gambardella, Giarratana, and Panico 2009; Sauermann 2017). In addition, employees in start-ups are those who are less concerned about job security (Sauermann 2017). In this case of start-ups, giving higher titles is one of the non-monetary incentives that start-ups provide to its employees in the form of higher position job titles.

In this chapter, using data from unique context of Indian internet based start-ups, I ask if start-ups can retain those employees to whom they provide senior job titles. In an attempt to address this issue of retention, I take a question driven approach.

Context & Data

Context: Consumer Digital or Internet Based Start-ups in India

The context of the study is consumer digital startups or internet based startups in India founded during 2004-2013. I use a linked employee-employer dataset constructed entirely using publicly available information on internet. I described the dataset and process of data collection in detail in chapter 2. This study is at an employee level and employee-firm is the unit of analysis.

Sample of employees used for this study consists of 134,858 employees. This is after cleaning the data. Employee data consists of joining time, leaving time, job title, job description, company names and educational qualifications. Employees who do not report joining time or leaving time are not included in this study.

In case of managerial and functional roles. After classifying employees to managerial and functional using job titles, the number of employees is 74,684. This is because of missing job title data and overlap of managerial and functional roles. Only those employees whose job title is clearly classified are included in analyses with organizational role variable.

Measures & Methods

Data is setup at a cross-sectional level. Employee – Start-up is the unit of observation.

Dependent Variable:

Dependent variable is a binary variable that takes a value equal to one if the employee leaves the current job at start-up and zero if he stays in the current job at start-up.

I use job titles reported by employees are to code transition. In this case, I do not have to make any assumptions as to who is a founding team member or not. Job titles that say founder or co-founder are clearly founding team members. This is one of the key advantages of this dataset as there is no ambiguity concerning employee job titles.

Independent & Control Variables:

Senior – Binary variable that takes a value of 1 if the employee is a senior-level employee irrespective of nature of task.

I use job titles reported by employees to code this variable. If a job title contains the word ‘senior’, then I consider the employee to be a senior employee. Say, Senior Programmer or Senior Manager, etc.

Age of start-up - this is the age of start-up (in years) at the time when employee joins the start-up. This is a continuous measure.

Early exposure – This is a dummy variable that takes a value of 1 if the employee/joiner has joined the startup within a year (more precisely, first four quarters after setting up the website) of its founding and takes a value of 0 for all other employees who are the later phase employees.

Prior Experience (Number of Prior Jobs held) – The number of jobs that an employee held prior to joining the startup is taken into account. This variable shall take into account the number of career transitions that an individual underwent prior to joining the startup. This measure gives one aspect of experience, which is the breadth in terms of number of job stints of employee. However, does not completely reveal the nature of experience. The individuals with greater number of jobs could be different from those with less number of jobs but equivalent experience in terms of amount of time.

Managerial role - Takes a value of 1 for roles contributing to managerial capabilities of firm and 0 for those roles contributing to functional capabilities. Managerial roles are those that have job titles associated with strategy, human resources, finance and legal. Functional roles are those that have job titles associated with production, marketing/sales, engineering, research and development. Titles are coded irrespective of positions. C-level or VP level or manager level employee is considered to have a managerial role if say his job title say finance department, i.e, CFO (Chief Financial Officer) or VP (Vice President) – Finance or Assistant manager – Finance, all of them have managerial role.

Education variables – The highest level of education of an individual is included. A dummy variable for each level of education, PhD, masters and bachelors is included if it their highest level of education.

Controls for the type of education are also included. Engineering, Commerce and MBA are three dummy variables that take values of 1 if the individual has education in respective fields. In other cases the variables take a value of 0.

Size of start-up – size of start-up is measured using number of employees. Size in year t is the average number of employees in start-up in all quarters in year t. Say, there is one employee in for four quarters in a year, then size takes a value of 0.25

I use cox proportional hazard model for analysis.

Discussion & Results

Start-ups inflate job titles to signal that they have a flexible work environment, or signal to outsiders that they value their employees or provide titles in lieu of salaries. They can also do that to let their employees know that they consider them valuable. These inflated job titles are to attract potential employees or to retain them.

Are 'senior job titles' correlated with prior experience of employees?

Correlation of senior job title with prior work experience of an employee and type of role (managerial or functional) can be seen in Table 5. 1. Dependent variable is a binary variable that takes a value of 1 if an employee has senior job title and a value 0 otherwise. Model (1) is for all employees in all start-ups. Coefficient of greater prior experience (number

of jobs) is significant and positive, which implies that *employees with greater prior experience are more likely to have senior job titles.*

Table 5. 1 about here

Are 'senior job titles' correlated with prior experience of employees in better performing firms?

Start-ups are grouped into quintiles by their growth rate in terms of number of employees. In Table 5. 1, Model (2) is for employees in start-ups in first growth quintile, model (3) is for employees in start-ups in second growth quintile, model (4) is for employees in start-ups in third growth quintile, model (5) is for employees in start-ups in fourth growth quintile and model (6) is for employees in start-ups in fifth growth quintile. Coefficient of greater prior experience (number of jobs) is significant, positive across groups, and consistent. This implies that *employees with greater prior experience are more likely to have senior job titles in better performing firms.*

Table 5. 1 about here

Are 'senior job titles' correlated with 'type of organizational role' of employees?

Type of Organizational role: I classify roles in two categories – managerial or functional

This classification of managerial and functional capabilities is broad and captures the essence of roles within the organization (Fortune and Mitchell 2012). Managerial roles are those that contribute to managerial capabilities of the firm and functional roles contribute to functional capabilities. Managerial capabilities are processes associated with the integration and coordination of firm resources and activities. Functional capabilities are processes associated with the day-to-day operational activities of the firm related to the production of products and services (Fortune and Mitchell 2012). Resource based theory emphasizes on human capital contributing to capabilities of firm. Human capital is the key asset to the organization and this asset builds capabilities (Teece et. al., 1997). I follow classification from prior literature (Fortune and Mitchell 2012) in order to code managerial and functional roles. Managerial roles are those that have job titles associated with strategy, human resources, finance and legal. Functional roles are those that have job titles associated with production, marketing/sales, engineering, research and development.

Managerial role - Takes a value of 1 for roles contributing to managerial capabilities of firm and 0 for those roles contributing to functional capabilities. Managerial roles are those that have job titles associated with strategy, human resources, finance and legal. Functional roles are those that have job titles associated with production, marketing/sales, engineering, research and development. Titles are coded irrespective of positions. This variable takes a value of 0 for functional roles.

Correlation of senior job title with prior work experience of an employee and type of role (managerial or functional) can be seen in Table 5. 1. Dependent variable is a binary variable that takes a value of 1 if an employee has senior job title and a value 0 otherwise. Model (1) is for all employees in all start-ups. Coefficient of managerial variable is significant and negative, which implies that *employees with managerial roles are less likely to have senior job titles. This can be interpreted as employees with functional roles are more likely to have senior titles.* Managerial employees also have other top management roles or eccentric chief roles that are not captured by the way ‘inflated’ titles are measured currently using senior titles.

Table 5. 1 about here

Are ‘senior job titles’ correlated with ‘type of organizational role’ of employees in better performing firms?

Start-ups are grouped into quintiles by their growth rate in terms of number of employees. In Table 5. 1, Model (2) is for employees in start-ups in first growth quintile, model (3) is for employees in start-ups in second growth quintile, model (4) is for employees in start-ups in third growth quintile, model (5) is for employees in start-ups in fourth growth quintile and model (6) is for employees in start-ups in fifth growth quintile. Coefficient of managerial variable is significant and negative. This implies that *employees with functional roles are more likely to have senior job titles in better performing firms.*

Table 5. 1 about here

Are 'EARLY senior job titles' correlated with prior experience of employees?

Correlation of '*early senior*' job title with prior work experience of an employee and type of role (managerial or functional) can be seen in Table 5. 2Table 5. 1. Dependent variable is a binary variable that takes a value of 1 if an employee has senior job title & is an early employee i.e., who joined the start-up within first four quarters of founding the start-up. And takes a value 0 otherwise. Model (1) is for all employees in all start-ups. Coefficient of greater prior experience (number of jobs) is NOT significant, which implies that *prior experience is not correlated with senior job titles for early employees.*

Table 5. 2 about here

Are 'EARLY senior job titles' correlated with prior experience of employees in better performing firms?

Start-ups are grouped into quintiles by their growth rate in terms of number of employees. In Table 5. 2, Model (2) is for employees in start-ups in first growth quintile, model (3) is for employees in start-ups in second growth quintile, model (4) is for employees in start-ups in third growth quintile, model (5) is for employees in start-ups in fourth growth quintile

and model (6) is for employees in start-ups in fifth growth quintile. Coefficient of greater prior experience (number of jobs) is NOT significant. This implies that *prior experience is not correlated with early employees having a senior title in better performing firms.*

Table 5. 2 about here

Are 'EARLY senior job titles' correlated with 'type of organizational role' of employees?

Correlation of '*early senior*' job title with prior work experience of an employee and type of role (managerial or functional) can be seen in Table 5. 2. Dependent variable is a binary variable that takes a value of 1 if an employee has senior job title and a value 0 otherwise. Model (1) is for all employees in all start-ups. Coefficient of managerial variable is significant and negative, which implies that *early employees with managerial roles are less likely to have senior job titles. This can be interpreted as early employees with functional roles are more likely to have senior titles.* Managerial employees also have other top management roles or eccentric chief roles that are not captured by the way 'inflated' titles are measured currently using senior titles.

Table 5. 2 about here

Are 'EARLY senior job titles' correlated with 'type of organizational role' of employees in better performing firms?

Start-ups are grouped into quintiles by their growth rate in terms of number of employees. In Table 5. 2, Model (2) is for employees in start-ups in first growth quintile, model (3) is for employees in start-ups in second growth quintile, model (4) is for employees in start-ups in third growth quintile, model (5) is for employees in start-ups in fourth growth quintile and model (6) is for employees in start-ups in fifth growth quintile. Coefficient of managerial variable is negative and strongly significant for employees working in high performing firms in Quintile 5. Coefficient of managerial variable is negative and weakly significant for employees working in medium performing firms in Quintile 3 & 4. Coefficient of managerial variable is NOT significant for employees working in low performing firms in Quintile 1 & 2. *Early employees with managerial roles are less likely to have senior job titles in high growth firms.*

Table 5. 2 about here

These set of questions set basis for further analysis where I try to understand exit patterns of senior variables.

In Table 5. 3, results of cox proportional hazard model to observe exit of senior hires are presented. In model (1) , no controls are included, whereas in model (2), size of start-up at the time of employee joining and education variables are included. In model (3), in addition to all variables included in model (2), year fixed effects are included. Coefficient of senior

variable is negative and significant across all models (1) - (3). Employees with senior titles are less likely to leave. Coefficient of size of start-up is significant but is very small or nearly zero.

Table 5. 3 about here

In Table 5. 4, results of cox proportional hazard for exit of senior experienced employees are provided. In model (1), prior experience of individual is the independent variable and size of start-up at the time of joining and education controls are included. All three models (1) – (3) have year fixed effects included. Coefficient of experience variable is positive and significant. Prior experience is positively associated with risk of exit. Employees with greater prior experience are more likely to exit. Increase in one job prior to joining the start-up increases the risk of employee leaving by 3.1%. This is consistent across models (2) & (3). In model (2), in addition to variables included in model (1), senior variable is included. Coefficient of senior variable is negative and significant. Employees with senior job title are 18.8% at higher risk of exit compared to those employees with no senior job title. In model (3), interaction between prior experience of individual and senior job title is included. The coefficient of interaction term is positive and significant. With experience of an individual increased by one job before joining the start-up, the risk of exit of employee holding senior title is increased by $(0.024+0.09)$ i.e., 11.4%. Whereas, for an employee not holding senior title, the risk of exit increases by 0.024 or 2.4%. On the other hand, for senior employee with no prior experience, the risk of exit is lower by 33.6%.

Table 5. 4 about here

In Table 5. 5, results of cox proportional hazard model for exit of senior managerial hires are presented. Year fixed effects are included in all models (1) – (3). In model (1), managerial is the independent variable. This managerial variable takes a value equal to one for employee who has a role that contributes to managerial capabilities of the firm and zero for employee whose role contributes to functional capabilities of a firm. Model (1) includes size of start-up at time of joining, education controls of the individual and year fixed effects. All three models (1) – (3) have year fixed effects included. In model (1), coefficient of managerial variable in model (1) is negative and significant. This is consistent across models (2) & (3). Those employees who hold managerial roles are less likely to exit compared to those employees holding functional roles in the start-up. Managerial employees are at 13.4% lower risk of leaving the firm compared to functional employees. It is interesting to note that functional employees are more likely to exit compared to managerial employees. In model (2), in addition to all variables included in model (1), senior variable is included. Senior employees 24.9% at lower risk of leaving compared to those employees who do not hold senior titles. In model (3), interaction between senior and managerial variables is included. Coefficient of interaction term is positive and significant. Risk of exit of senior managerial employee is $(-0.282-0.158+0.130)$ whereas the risk of exit of senior functional employee is -0.282 . Both managerial and functional senior employees are less likely to exit but the risk of exit of functional employee is lower than that of managerial employee by 12.8%.

Table 5. 5 about here

In Table 5. 6, results of cox proportional hazards of senior employees by timing of joining the start-up are presented. Coefficient of start-up age at the time of joining of employee is positive. Employees who join when the start-up is older are at a greater risk of exit. Risk of exit of an employee 2.6% more than the risk of exit of an employee who joined a year before him. This coefficient of start-up at the time of employee joining is consistently positive and significant across all models (1) – (3). In model (3), interaction term between senior and age of start-up at the time of joining are included. It is interesting to note that the coefficient of senior variable is positive but no more significant in model (3). The coefficient of senior variable signifies the very beginning of the firm or when age is zero i.e., less than a year in this case since age is measured in years. This is not significant at the very beginning or early phases of start-up. Coefficient of age of start-up at time of joining of employee is positive and significant. This variable is the risk of exit of an employee when senior variable takes a value of zero. Employees who do not hold senior titles are more likely to leave if they join later. A non-senior employee is 3.1% more likely to exit compared to a non-senior employee who joined the start-up one year before him. Interaction term between senior variable and start-up age is negative and significant. As age of the start-up at the time of joining increases, senior employees are at lower risk of exit.

Table 5. 6 about here

In Table 5. 7, results of cox proportional hazard model of exit of senior employees by their phase of exposure to start-up are presented. Coefficient of senior variable is negative and significant in model (2). Employees with senior job title are less likely to exit compared to employees without senior job title. In model (1), early exposure variable is included. Coefficient of early exposure is negative and significant. Employees who are exposed to early phases of the firm or who join in the first four quarters of founding the start-up are less likely to exit compared to those employees who join the start-up at later phases. In model (3), interaction between senior variable and early exposure variable is negative and significant. Early exposure increases the risk of exit of employees with senior title.

Table 5. 7 about here

We can broadly classify ‘inflated job titles’ to two types, one is eccentric titles and the other are simple hierarchically inflated titles. In this case, I considered only the simple hierarchically inflated titles. A few examples of inflated titles are ‘chief poetry officer’, ‘chief number cruncher’, ‘chief ninja’, ‘senior content writer’, ‘senior marketing manager’, ‘senior mobile application developer’ etc. While some of the titles that have C-level roles and are eccentric seem to be inflated leadership positions while senior roles give employees a positional hike which is also recognized by external labor market.

Although this had been a prevalent trend in American companies, it is also highly adopted in China and India¹⁸. These job titles have several implications for both individuals and firms. While they provide a signal for perceived value of an employee, these titles may alter signals that other labor market peers of start-ups receive. I am further interested in looking at employee mobility patterns, as to where they come from and which title they have prior to joining the start-up and the titles they have after leaving the start-up.

Understanding mobility patterns of employees and career paths of employees is very important as that can be a valuable signal to the firm regarding its learning environment. Instead of merely noticing their turnover rates, it will also help to learn from their mobility patterns.

18 Too many chiefs. (2010, June). *The Economist*. Retrieved from <http://www.economist.com/node/16423358#print>

Table 5. 1: Senior title and correlations

Dependent variable: Binary variable that takes a value of 1 if an employee has senior job title and a value 0 otherwise.

VARIABLES	(1) All firms	(2) Quintile 1	(3) Quintile 2	(4) Quintile 3	(5) Quintile 4	(6) Quintile 5
Experience	0.021*** (0.001)	0.009** (0.004)	0.026*** (0.003)	0.026*** (0.002)	0.024*** (0.002)	0.018*** (0.001)
Managerial	-0.036*** (0.003)	-0.012 (0.014)	-0.044*** (0.010)	-0.055*** (0.007)	-0.047*** (0.005)	-0.024*** (0.004)
Constant	0.105*** (0.002)	0.049*** (0.009)	0.096*** (0.006)	0.111*** (0.004)	0.108*** (0.003)	0.103*** (0.003)
Observations	75,450	1,290	5,262	12,160	21,712	34,050
R-squared	0.011	0.004	0.014	0.014	0.014	0.008

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. 2: Early Senior title and correlations

Dependent variable: Binary variable that takes a value of 1 if an employee has senior job title and joined the start-up within first four quarters of founding the start-up. And takes a value 0 otherwise.

VARIABLES	(1) All firms	(2) Quintile 1	(3) Quintile 2	(4) Quintile 3	(5) Quintile 4	(6) Quintile 5
priorex_num	0.000* (0.000)	0.001 (0.002)	0.002 (0.001)	-0.000 (0.001)	0.000 (0.000)	0.000* (0.000)
managerial	-0.004*** (0.001)	-0.007 (0.007)	-0.004 (0.004)	-0.003* (0.002)	-0.002** (0.001)	-0.004*** (0.001)
Constant	0.007*** (0.000)	0.013*** (0.004)	0.013*** (0.002)	0.008*** (0.001)	0.005*** (0.001)	0.006*** (0.001)
Observations	75,450	1,290	5,262	12,160	21,712	34,050
R-squared	0.000	0.001	0.001	0.000	0.000	0.001

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. 3: Cox proportional hazards for exit of ‘Senior Hires’.

VARIABLES	(1) exit	(2) exit	(3) exit
Senior	-0.180*** (0.012)	-0.183*** (0.012)	-0.188*** (0.012)
size		-0.000*** (0.000)	-0.000*** (0.000)
Highest_Bachelor		0.395*** (0.011)	0.401*** (0.011)
Highest_Master		0.506*** (0.012)	0.507*** (0.012)
Highest_PHD		0.114 (0.134)	0.128 (0.131)
Engineering		0.353*** (0.009)	0.356*** (0.009)
Bachelor_commerce		-0.179*** (0.014)	-0.183*** (0.014)
MBA		0.014 (0.013)	0.013 (0.013)
Observations	133,351	133,351	133,351
Year FE	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 4: Cox proportional hazards for exit of ‘Senior Experienced Hires’.

VARIABLES	(1) exit	(2) exit	(3) exit
Senior		-0.188*** (0.012)	-0.336*** (0.017)
Experience	0.031*** (0.002)	0.031*** (0.002)	0.024*** (0.002)
Senior*Experience			0.090*** (0.008)
size	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Highest_Bachelor	0.401*** (0.011)	0.402*** (0.011)	0.402*** (0.011)
Highest_Master	0.493*** (0.012)	0.498*** (0.012)	0.498*** (0.012)
Highest_PHD	0.089 (0.131)	0.080 (0.131)	0.077 (0.132)
Engineering	0.341*** (0.009)	0.341*** (0.009)	0.341*** (0.009)
Bachelor_commerce	-0.190*** (0.014)	-0.188*** (0.014)	-0.189*** (0.014)
MBA	0.008 (0.013)	0.003 (0.013)	0.004 (0.013)
Observations	133,351	133,351	133,351
Year FE	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 5: Cox proportional hazards for exit of ‘Senior Managerial Hires’.

VARIABLES	(1) exit	(2) exit	(3) exit
Senior		-0.249*** (0.015)	-0.282*** (0.018)
Managerial	-0.134*** (0.012)	-0.145*** (0.012)	-0.158*** (0.013)
Senior*Managerial			0.130*** (0.035)
size	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Highest_Bachelor	0.392*** (0.014)	0.393*** (0.014)	0.393*** (0.014)
Highest_Master	0.502*** (0.015)	0.511*** (0.015)	0.512*** (0.015)
Highest_PHD	0.257 (0.206)	0.246 (0.206)	0.247 (0.206)
Engineering	0.359*** (0.012)	0.359*** (0.012)	0.359*** (0.012)
Bachelor_commerce	-0.174*** (0.021)	-0.170*** (0.021)	-0.172*** (0.021)
MBA	0.073*** (0.019) (0.134)	0.066*** (0.019) (0.135)	0.063*** (0.019) (0.135)
Observations	74,684	74,684	74,684
Year FE	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 6: Cox proportional hazards for exit of ‘Senior Hires’ by ‘timing of joining’.

VARIABLES	(1) exit	(2) exit	(3) exit
Senior		-0.194*** (0.012)	0.032 (0.026)
Start-up Age	0.026*** (0.002)	0.027*** (0.002)	0.031*** (0.002)
Senior*Start-up Age			-0.053*** (0.006)
size	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Highest_Bachelor	0.402*** (0.011)	0.402*** (0.011)	0.402*** (0.011)
Highest_Master	0.501*** (0.012)	0.506*** (0.012)	0.506*** (0.012)
Highest_PHD	0.144 (0.131)	0.135 (0.131)	0.138 (0.131)
Engineering	0.360*** (0.009)	0.359*** (0.009)	0.360*** (0.009)
Bachelor_commerce	-0.191*** (0.014)	-0.189*** (0.014)	-0.189*** (0.014)
MBA	0.016 (0.013)	0.010 (0.013)	0.011 (0.013)
Observations	133,351	133,351	133,351
Year FE	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 7: Cox proportional hazards for exit of ‘Senior Early Hires’.

VARIABLES	(1) exit	(2) exit	(3) exit
Senior		-0.216*** (0.012)	-0.244*** (0.012)
Early Exposure	-0.556*** (0.015)	-0.570*** (0.016)	-0.610*** (0.016)
Senior*Early Exposure			0.574*** (0.049)
size	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Highest_Bachelor	0.401*** (0.011)	0.401*** (0.011)	0.401*** (0.011)
Highest_Master	0.501*** (0.012)	0.506*** (0.012)	0.506*** (0.012)
Highest_PHD	0.234* (0.129)	0.226* (0.129)	0.228* (0.130)
Engineering	0.371*** (0.009)	0.371*** (0.009)	0.372*** (0.009)
Bachelor_commerce	-0.200*** (0.014)	-0.197*** (0.014)	-0.197*** (0.014)
MBA	0.016 (0.013)	0.010 (0.013)	0.010 (0.013)
Observations	133,351	133,351	133,351
Year FE	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

CHAPTER 6: Conclusion and Future Work

Current dissertation lies at the intersection of Entrepreneurship and Strategic Human Capital literatures. As part of my future research , I would like to delve deeper into each of these individual streams of literature by strengthening the connect between them. Entrepreneurship literature started to focus upon employees of start-ups and not just the founding team members. This opens a new possibility to study human capital from entrepreneurial perspectives. Questions remain as to match between founders and their initial hires or match between founders and human capital strategies. Complementarities between founder human capital and employee human capital also contribute to start-up performance. We do not yet have answers to many such questions and my focus of my future research would be to address these unanswered yet important aspects of entrepreneurship.

Specifically, I am interested in delving deeper into the type of human capital profiles that lead to scaling-up of start-ups. In first study or chapter 3, I look at the hierarchical framework in terms of presence or absence of a position, I further want to look at the nature of human capital in the team comprising of hierarchical structure. Human capital of executives who take up initial positions in the start-up are shown to have an impact on the successors of the positions (M. D. Burton and Beckman 2007). It is not founder imprinting alone that persists, but the nature of early hires also impacts future organizational performance.

Other research that I am further interested in is knowledge spillovers and employee churn during periods of recession (Lazear and Spletzer 2012). There is very scant evidence of labor market readjustments during the period of 2007-2008 recession. Prior evidence suggests that periods of low economic activity leads to creation of start-ups but does

not provide sufficient evidence of human capital re-allocation among firms. Two sets of opposing narratives, de-coupling and coupling effects of financial crisis on Asian economies are discussed but there is no sufficient empirical evidence for either of these effects. I would like to explore if there are productivity spillovers from large firms to start-ups during the time of crisis owing to increased employee mobility.

Entrepreneurial teams(Jung et. al., 2017), managerial practices (Bloom et. al., 2013; Bloom & Reenen, 2010), organizational design (Desantola & Gulati, 2017) and individual career paths (Burton et. al., 2016) are the research streams that I would broadly focus upon as part of my future research.

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Appendix

Examples of Industry categories of firms (As reported by companies in LinkedIn)

Industry

Accounting
 Airlines/Aviation
 Alternative Medicine
 Animation
 Apparel & Fashion
 Architecture & Planning
 Arts and Crafts
 Automotive
 Banking
 Biotechnology
 Broadcast Media
 Building Materials
 Business Supplies and Equipment
 Capital Markets
 Civic & Social Organization
 Commercial Real Estate
 Computer & Network Security
 Computer Games
 Computer Hardware
 Computer Networking
 Computer Software
 Construction
 Consumer Electronics
 Consumer Goods
 Consumer Services
 Cosmetics

Example of Individual data

(Individuals and companies have been de-identified and given unique identifiers in the dataset)

Following is an example of one typical database entry of career history an individual.

Employee ID	Company ID	Start Date	End Date	Title
25679	6789	June 2010	Present	Director IT
25679	5678	April 2008	May 2010	Project Manager
25679	890	June 2006	March 2008	Software Developer
25679	687799	March 2005	May 2006	Software Programmer