Spatial mobility and opportunity-driven entrepreneurship: The evidence from China labor-force dynamics survey

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Abstract: Literature on regional entrepreneurship has tended to neglect inter-regional flows of human capital, and yet spatial mobility provide the nascent entrepreneurs with multi-location knowledge and networks to exploit entrepreneurial opportunities. The paper fills the gap by adopting an agent-environment interactionist perspective in the investigation on the interrelation between mobility and entrepreneurship. To be more specific, it deals with two underlying themes. First, the way through which the multi-location experiences and non-local knowledge equip the migrants with the pursuit of opportunity-driven entrepreneurship. Second, the distinctive relationship between the regional environment and opportunity-driven entrepreneurial motives for individuals with and without spatial mobility experiences. These themes are investigated with the China labor-force dynamics survey data, comparing the characteristics and drivers of entrepreneurial motives of the migrants and locals. The survey data presents clear evidence of a higher prevalence of opportunity-driven entrepreneurship in migrant entrepreneurs compared to their local counterparts. Furthermore, the ordered logit regression results demonstrate that spatial mobility experiences significantly promote the likelihood of entering into opportunity-based business. The regional environment exerts impacts on migrants and non-migrants' entrepreneurial motives, yet in different ways. Local entrepreneurs are more influenced by the endogenous nature of firm ecology in the city, whereas migrant entrepreneurs start business pulled by both local demands and extra-local connectedness to greater market areas. Finally, the paper reflects upon possible implications for a more targeted and inclusive entrepreneurial policy, as well as the future areas of research.

Keywords: Spatial mobility; Opportunity-driven entrepreneurship; Migrant; Regional entrepreneurial environment

1. Introduction

From the seminal work of Schumpeter (1934), it has become established that entrepreneurship is a pivotal mechanism for innovation and invention to be exploited and commercialized. Opportunity-driven entrepreneurship is defined as entrepreneurial decisions motivated by perception and exploitation of innovative business ideas (Reynolds et al. 2001). This notion has been first introduced in the survey of Global Entrepreneurship Monitor, in contrast to the necessity-driven entrepreneurship whereby individuals are forced into starting own business because of unemployment or job dissatisfaction (Caliendo and Kritikos 2010). Opportunity-driven entrepreneurship, unlike necessity-driven entrepreneurship, positively influences innovation and technological progress, thus constituting a form of productive entrepreneurship (Mrozewski and Kratzer 2017; Nicotra et al. 2018).

The last decade has seen the rapid growth in literature of regional entrepreneurship, characterized by studies from regional scientists and economic geographers that view entrepreneurship as a regional phenomenon (Feldman et al. 2005; Audretsch and Lehmann 2005; Delgado et al. 2010; Acs et al. 2013; Huggins and Thompson 2014; Stam 2015). Many studies have primarily focused on opportunity-driven entrepreneurship, namely the high-growth and high-potential start-ups that are driven by exploiting market opportunities for new technologies, combinations, and ideas. Theories along the streams of regional entrepreneurship studies, however, overemphasize the endogenous processes of entrepreneurship and innovation development. It is true that entrepreneurial opportunities are concentrated in certain places that possess well-functioning entrepreneurial ecosystems, but it also highly depends on the agency of the people to exploit those opportunities. Nevertheless, the question concerning who starts the opportunity-driven businesses still captures limited research attention. Saxenian's (2002) study about the Argonauts entrepreneurs in Silicon Valley has, for the first time, revealed the economic contributions of migrants as both aspiring entrepreneurs and trade facilitators. Indeed, migrants are increasingly viewed as the source of regional economic revitalization (Jokela 2009; Lee 2015). From this aspect, the inter-regional mobility of human capital and heterogenous locational

knowledge play a crucial yet understudied role in fostering high-quality entrepreneurship.

As a starting point of conceptual clarity, the study object of this paper is targeted at the internal migrants in China for two reasons. First, internal migrants in the world are about 740 million, more than three times as many as the international migrants (IOM 2012). According to the 2010 census (CSSB 2011), internal migrants in China are over 220 million, taking about one-sixth of China's total population. As such, the internal migrant deserves research attention not only owing to its massive scale, but also to its wider implication for human agency in seeking economic opportunities and upward mobility. Secondly, internal migration serves as a suitable setting to examine the role of spatial mobility at the regional level rather than at the country level. Notwithstanding the long-standing emphasis from economic geographers on international migration as a more prominent way of knowledge transfer (Saxenian 2002), recent studies have started to notice that international migrants often have spatial biographies as internal migrants before embarking on an inter-country migration journey (King 2002; King and Skeldon 2010). It implicitly indicates the fluid and complex processes of mobility in that locational knowledge is accumulated in a gradual manner. As in the case of international migration, immigrant entrepreneurs have to overcome both region- (e.g. from Beijing to London) and country-level (e.g. from China to the UK) barriers in the institutional, cultural and social environment. Focusing on internal migrant enables us to examine whether inter-regional knowledge heterogeneity serves as a valuable asset for high-quality entrepreneurial activities.

The role of internal migrants in promoting regional entrepreneurship via spatial mobility and non-local knowledge have become evident in a number of recent studies (Frederiksen et al. 2016; Martynovich 2017; Liu et al. 2019). In Martynovich (2017)'s study, he has compared the entrepreneurial entries of local and non-local individuals, examining the relative importance of non-local knowledge versus local embeddedness in entrepreneurship. The article builds upon this strand of research and addresses two research questions in relation to the entrepreneurial activities of the internal migrants: First, how do experiences of non-local knowledge contribute to the formation of opportunity-based entrepreneurial motives? Second, to what extent and in what ways does the regional environment interact with non-local knowledge, embedded within the entrepreneurial migrants, to shape opportunity-driven entrepreneurship? The paper intends to move beyond the notion that regional entrepreneurial environment is equally

accessible to individuals or organizations located within. As such, it advances the literature on knowledge-related mobility, through an agent-environment interactionist perspective, about how spatial mobility experiences effect in tandem with spatial attributes at the regional level.

The paper is structured as follows. Sect. 2 reviews the literature related to the relationship between spatial mobility and opportunity-driven entrepreneurship, and hypothesizes on the varying relationship between regional environment and entrepreneurial motives among individuals with and without spatial mobility experiences. In Sect. 3 I describe the nation-wide survey data, and the methodology used to compare the divergent regional factors associated with migrants and non-migrants' entrepreneurial motives. Sect. 4 presents the regression results and the implications in regard to spatial mobility and entrepreneurial motives. Finally, the last section summarizes the results and the contribution to existing literature.

2. Theory background

Spatial mobility experiences and opportunity-driven entrepreneurship

Opportunity-driven entrepreneurship is regarded as a form of productive entrepreneurship, whereby entrepreneurial motives are driven by the individuals' pursuit of achievements with the perception of market opportunities and exploitation of innovative ideas (Reynolds et al. 2001). In contrast, necessity-driven entrepreneurship is pushed by personal needs for survival like unattractive or inaccessible job opportunities. Necessity-driven entrepreneurship account for the majority of the entrepreneurial activities in emerging economies (Herrington and Kew 2016), whereby the social welfare system is underdeveloped. In general, opportunity-driven entrepreneurship generates more employment and income than the necessity-driven one (Acs 2006).

Innovation studies have already established evidence that suggests heterogeneous sources of knowledge could trigger novel combination and innovation. While previous works focus primarily on the diversity of industrial structure (Jacobs 1969; Neffke et al. 2011), recent studies in economic geography started to pick up on the diversity of economic agents, and among others, entrepreneurial agents. The narratives of migrants as enterprising and entrepreneurial business owners, diffusing knowledge, information, and skills across space, have been gaining increasing consensus in recent studies (Hoisl

2009; Frederiksen et al. 2016; Martinovich 2017; Neffke et al. 2018). Until recently, spatial mobility has been associated with entrepreneurial spirit and urban innovativeness. Spatial mobility of the migrants is defined in this paper as the personal experiences of residing in more than one place. Trippl et al. (2018) systematically present the importance of non-local knowledge in creating a new regional path in all types of regional innovation systems, although they implicitly highlight more on the globally transferred knowledge and network from the global north to the south. Other studies, however, draw upon inter-regional mobility within a country. Frederiksen et al. (2016) challenge the predominant focus on either local embeddedness or international talent flow in entrepreneurial studies, empirically supporting the fact that moving across municipalities within national boundaries increases the likelihood of entering entrepreneurship. In particular, several studies posit that previous argumentation about the local embeddedness of start-up business only considers the location of the immediate employer without accounting for a series of life experiences across organizations and places (Harrison et al. 2004; Hanson 2005; Martinovich 2017).

In regard to facilitating opportunity-driven entrepreneurship, to be more specific, heterogenous locational experiences take effect in two ways. Firstly, the experiences of living and working in more than one place equip the migrants with multi-location knowledge. The concept of territorial knowledge dynamics, proposed by Crevoisier and Jeannerat (2009), addresses the rise of mobility in modern societal dynamics. In the knowledge circulation paradigm, competencies are acquired and developed through the mobility of professionals (Mahroum and de Guchtenheire 2006). Anchoring knowledge, namely adapting knowledge from elsewhere to the new local context, constitutes a pivotal means of accumulating knowledge for localities. Migrants, as the physical carriers of knowledge across space, gain new perspectives and capture niche entrepreneurial opportunities when interacting with the new resident places. Nevertheless, the interaction and anchoring processes for migrants hinge upon local institutional settings and norms.

Secondly, migrants possess translocal network advantages compared to non-mobile local people. Migrants could encounter difficulties in capitalizing upon entrepreneurial experiences and networks in other city regions within the new resident regions (Ley 2006). But still, migrant entrepreneurs are able to compensate for the loss of local social networks with the accumulation of human and financial capital through migration (Demurger and Xu 2011). There are ample pieces of evidence in the literature

supporting the network capacity of migrant entrepreneurs in utilizing their position as the structural holes within the trans-local networks to establish businesses (Frederiksen et al. 2016;). In Granovetter's (1973, p. 1366) agenda-setting work about social ties, he argues that information diffused through weak ties "can reach a larger number of people, and transverse greater social distance". Compared to the necessity-driven business, opportunity-driven entrepreneurship demands a wide geographical range of network resources to support the high growth potentials.

Based on the previous discussion, the first hypothesis is formulated as follows:

Hypothesis 1: Migrant's non-local knowledge will be positively related to the formation of opportunity-driven entrepreneurship.

Migrant entrepreneurs and interaction with opportunity structure in the city region

Entrepreneurial processes are heavily reliant upon the institutionally-constrained matching processes between motivated entrepreneurial talents and potential entrepreneurial opportunities (Kloosterman and Rath 2001). The regional entrepreneurship literature, developed from the beginning of the 2000s, has suggested a myriad of factors at the level of city region encouraging or hindering entrepreneurialism. City-regional forces do not only shape markets and nurture opportunities in general, but they also construct structures that could affect the accessibility to opportunities for different kinds of entrepreneurs (Hackler and Mayer 2008). Arguably, migrant and non-migrant face dissimilar regional opportunity structures in setting up firms and businesses, as they have differential access to resources at various spatial scales and varying degrees of local embeddedness (Dahl and Sorenson 2009; Fu 2016). Dahl and Sorenson (2009), in their argument of "embedded entrepreneur", postulates that proximity to family and friends help the entrepreneurs to assemble resources and recruit personnel. In this regard, local people are more able to navigate the local scene and get access to potential human capital to support the starting up phase. In contrast, the migrants could turn to the extra-local network and knowledge base to search for entrepreneurial opportunities and seek entrepreneurial support. Consequently, migrants and non-migrants possess distinctive sets of entrepreneurial knowledge and resources, which will impact upon their interaction with the regional entrepreneurial environment.

To begin with, the quantity of opportunities is identified in the literature as the key dimension of regional structure that influences the formation of opportunity-driven

entrepreneurship. From the demand side, the higher level of income of the city residents could support the exploitation of high-growth entrepreneurial opportunities. Fernandez-Serrano and Romero (2012) compare the quality of entrepreneurial activities in low-income regions with that in high-income ones, concluding that entrepreneurs with necessity-driven motives have a higher probability of being found in low-income regions. On the one hand, if the individuals would only want to start a necessity-driven business, they possess no incentive to move to higher income regions. On the other hand, wealthier cities, being able to nurture and support new business growth, act as a magnet for entrepreneurial individuals to seek opportunity-driven business. After all, for people with no willingness and capability to move, the income level of the residing cities should equally support both necessity- and opportunity-driven business.

Form the supply side, the knowledge spillover theory of entrepreneurship (KPTS), first proposed by German economist Audretsch (1995), has regarded regional knowledge stock and density of knowledge production organizations as the source of entrepreneurial activities (Audretsch and Lehmann 2005; Acs et al. 2013). In a word, entrepreneurial opportunities emanate from the not fully commercialized knowledge invested by incumbent firms and knowledge organizations (Audretsch and Lehmann 2005). However, transfer of knowledge from incumbent firms and organizations to new start-ups is highly dependent on entrepreneurial absorptive capacity whereby the nascent entrepreneurs are able to recognize the potential value of existing knowledge and undertake successful commercialization (Qian and Acs 2013). For both the migrants and locals, the quantities of opportunities existed in the surrounding environment incentivize them to enter into an opportunity-driven business, rather than a necessity-driven one. Although the locals might possess certain advantages in accessing to and understanding the local knowledge stock, the exposure to non-local knowledge in migrants could possibly compensate it with new ideas to transform the knowledge stock into marketable products or services (Frederiksen et al. 2016).

So far, the second set of hypotheses, concerning the association between the regional entrepreneurial opportunities and entrepreneurial motives for the migrants and locals, has been arrived as followed:

Hypothesis 2a: Migrants' likelihood to start the opportunity-based business is positively related to the income level in the city region.

Hypothesis 2b: Both migrants and locals' likelihood to start the opportunity-based business is positively related to the amount of knowledge stock in the city region.

The capability of regions to support high-impact entrepreneurship does not simply lie in the availability of entrepreneurial opportunities. Rather, the ecosystem for innovation and entrepreneurship are crucial (Corrente et al. 2019; Nicotra et al. 2018). The core argument of regional entrepreneurship ecosystem is that entrepreneurial activities occur within a community constituted of interdependent individuals supported with place-based social context (Henrekson and Sanandaji 2014; Audretsch and Belitski 2017). The underlying assumption in this argument points to the needs of embedding in the local environment in order to draw upon the benefits of the regional entrepreneurship ecosystem. As the locals have longer or uninterrupted experiences of social network building in the residing localities, their local embeddedness is very likely to be higher than the migrants, putting them in a privileged position to benefit from the ecosystem.

Many studies on regional entrepreneurial ecosystem establish a range of indicators to measure its functioning (Stam 2015; Qian 2018). Among these, entrepreneurial culture has been increasingly highlighted as one of the key driving forces (Huggins and Thompson 2014; Qian 2018; Corrente et al. 2019). An underlying mechanism, however, has been put forward by Sorenson (2017) in his study on the wax and wane of the Boston IT sector, in which he points out the endogeneity of regional entrepreneurial culture arising from the local firm ecology. The high number of small and medium-sized enterprises (SMEs) ensures that most of the employees have experiences working in an entrepreneurial environment, which is conducive to their accumulating business knowledge and networks, as well as deeming starting-up as a natural career choice. Meanwhile, agglomeration of smaller firms in the region boosts the demand for professional service aimed for firm start-up phase, thus lowering the barriers of entering the business (Samila and Sorenson 2011). Thereby, the firm ecology simultaneously reflects most indicators of the ecosystem, including competition and culture defined by Qian (2018), and entrepreneurial network and support infrastructure defined by Stam (2015). Inspired from Martynovich (2017, p.743)'s argument that potential entrepreneurs' risk-taking attitude is "strongly embedded in the local social, economic and cultural structures", the locals are more likely to be exposed to the SME-dominated immersion environment characterized by aspiring entrepreneurial mindsets. Likewise, Fu (2016) demonstrates that awareness of local start-up role model is able to nurture entrepreneurship in the software industry, and the network with local suppliers and

customers would further anchor the nascent entrepreneurs in the home location.

One more indicator that is not guaranteed by SME-dominated ecology is the availability of young talents. For start-up businesses, young and skilled labor constitutes the primary source of human capital to support the businesses in the beginning. Hence, starting up a new business is reliant on the availability of young skilled labor in the local labor market. Companies could be relocated to city regions with a large pool of talent for them to tap into (Florida 2006), yet in the case of start-up entrepreneurs, it is likely that they are not on par with large and established firms to compete for these young talents. Indeed, Barber et al. (1999) have identified the 'labor market segmentation' arising from the divergent preference and strategies of students to seek jobs in firms of different size. Thus, the association between talent availability and entrepreneurship is heavily dependent upon whether the job search preference of fresh graduates is more biased towards small organizations.

The third set of hypotheses concerns about the relationship between opportunity-driven entrepreneurship and regional entrepreneurship ecosystem, primarily referring to firm ecology and talent availability, and it has been formulated based on the above discussion on the differential interaction with the ecosystem by the migrants and locals.

Hypothesis 3a: Locals' likelihood to start the opportunity-based business is positively related to the SME-dominated firm ecology in the city region.

Hypothesis 3b: Both migrants and locals' likelihood to start the opportunity-based business is positively related to the availability of talents in the city region.

Gonzalez-Pernia and Pena-Legazkue (2015) distinguish opportunity-driven entrepreneurs into those targeting the local market and those obtain some revenue from extra-local markets. Opportunity-driven entrepreneurship is more outward-oriented than the necessity-driven ones. Thus, the ecosystem perspective should be complemented with extra-local linkages and dynamics to account for the nurturing environment of entrepreneurialism in an era characterized by high mobility of production factors (Crevoisier and Jeannerat 2009). Alert would-be-entrepreneurs are normally not only confined to market opportunities at the local level but aspire to reach out to and explore possibilities of the broader market area. Regions with greater market potentials, reaching beyond local scale to its accessible hinterland, is able to generate more business opportunities and enhance the likelihood for entrepreneurship (Audretsch and Keilbach 2008). In Figueiredo et al. (2002)'s study comparing firm

location choice within Portugal, he found that founders' locational choice for the new business is influenced by accessibility to the main markets, *inter alia*, in places of non-home origin. In the case of internal migrants, they could utilize their previous networks and knowledge in the home location or previous work location to serve the accessible market.

Another important extra-local linkage in a globalizing world is the inflow of foreign direct investments (FDI). FDI does not only constitute a key channel of knowledge spillover from the North to the South (Coe et al. 1997; Wang and Wu 2016), enlarging the stock of exploitable entrepreneurial opportunities, it also promotes new firm formation as they help the entrepreneurs overcome obstacles of weak socio-political conditions (Kim and Li 2014). Within the context of transition economies, foreign direct investment is a vital way of institutional learning and adaptation to market regulations (Wrana and Revilla Diez 2018), which is crucial in encouraging opportunity-driven entrepreneurial endeavors. The migrants occupy a clear edge in understanding and assimilating the foreign knowledge owing to their exposure to non-local knowledge in life or work experiences. Furthermore, the presence of foreign investors in the city regions, as the facilitators of institutional quality in transition economies, would benefit the migrants as they lack the local personal networks to navigate around the highly uncertain market environment with incomplete formal market regulations (Fu et al. 2013).

Finally, the fourth set of hypotheses about the relationship between migrants' entrepreneurial motives and extra-local linkages is formulated for the empirical test.

Hypothesis 4a: Migrant's likelihood to start the opportunity-based business is positively related to the regional access to the domestic market.

Hypothesis 4b: Migrant's likelihood to start the opportunity-based business is positively related to the regional inflow of foreign investment.

3. Data and Methodology

3.1 Data and the model

The study applies the China labor-force dynamics survey data (CLDS) in 2014, collected and owned by the Center for Social Survey at Sun Yat-sen University, China. The CLDS database has been conducted every two years starting from 2012, covering

households and individuals in both urban and rural communities in China except for Hong Kong, Taiwan, Macau, Tibet, and Hainan. The raw 2014 CLDS database consists of 23594 individuals in 404 urban or rural communities. It targeted at individuals aging from 15 to 64. CLDS database is valuable in terms of entrepreneurial studies because it offers detailed information on entrepreneurial activities, such as the entrepreneur's motives and entrepreneurial resources. Thus, it constitutes a sound database to identify opportunity-driven entrepreneurial motives versus the necessity-driven ones both within the whole population and within the migrants. For the purpose of the study, the final database for analysis only includes those interviewees that are self-employed or employers with valid answers on the entrepreneur's motives. To address the new period of urbanization whereby survival is by no means the sole factors driving the internal migration in China, the study includes only entrepreneurs starting the business after 2000. Finally, there are 1635 entrepreneurs in the analyzed sample.

We pool this dataset by adding region-specific variables to integrate the relationship between environmental impact at the prefecture-level city and entrepreneurial motives of individuals. Based on the location of the sampled population, the regional dataset covers socio-economic structures of 120 prefecture-level cities in China. The regional variables are derived from China City Statistics Yearbook, published by the National Bureau of Statistics of China (NBSC), from 1998 to 2014. In addition, China Patent Database published by China National Intellectual Property Administration (CNIPA) is used to get access to patent data at the level of prefecture city. The pooling of the regional dataset is case-by-case, as we include the average value of regional attributes within the last 3 years prior to the point of the individual's starting own businesses. It is thus able to catch potential effect of regional environment on the entrepreneurial motives of the individuals.

The nation-wide survey data at the level of city regions and regression practices help to compare the migrants and non-migrants by controlling for other factors. In this way, we could avoid the biased comparison between, for example, undereducated migrants with educated local people, and single out the effect that spatial mobility exerts on individual motivation to start opportunity-based businesses. In the CLDS, the survey interviewer asked the individuals whether they start their businesses because of good entrepreneurial opportunities or of no better employment choice. Adapting the four closed answers in an ordered way, the predictor variable is measured from 1 to 4 within the spectrum ranging from necessity-driven entrepreneurship to opportunity-driven

(Table 1). As some studies start to criticize the tendency to over-simplify entrepreneurial motives under such dualism (Williams 2008), the measurement does not dichotomize the surveyed entrepreneurs but instead order their entrepreneurial motives in four scales which allows the mixed drivers of necessity and opportunity in starting up businesses. Mrozewski and Kratzer (2017, p.1129) state that opportunity entrepreneur "often give up employment alternatives and in effect face high opportunity cost", and it renders them higher motivation to strive for the success of the entrepreneurial endeavors. Related to this, starting up with options to enter a promising employment career is given more weights towards the spectrum of opportunity-driven entrepreneurship than those without.

As the predictor is an ordered variable, ordered logit regression is employed to build up the multivariate model. The analysis aims to examine the driving factors influencing or associating with the individuals' entrepreneurial motives. For entrepreneur i, let x_i be a set of independent variables and y_i be an ordinal response variable with C categories, representing the ordinal categories indicating their entrepreneurial motives from most necessity-driven motive to the most opportunity-driven one. Then the ordered logit model is based on the following cumulative probabilities

$$EM_{ci} = \Pr(y_i \leq y_c | x_i) \qquad (1)$$

In this model, x_i is divided into the primary set of explanatory variables *CITYi*, which includes variables for regional factors in which the individual '*i*' starts the business, and *CVi*, which is a set of control variables including the personal attributes.

Thereby, EM_{ci} are related to a linear predictor

$$\beta^{'} x_i = \beta_0^{'} + \beta_1^{'} CITY_i + \beta_2^{'} CV_i \qquad (2)$$

Finally, the ordered logit model is transformed in logarithmic form as follows:

$$\text{logit}(EM_{ci}) = \ln\left(\frac{EM_{ci}}{1 - EM_{ci}}\right) = \alpha_c + \beta_1' CITY_i + +\beta_2' CV_i \qquad (3)$$

As the last cumulative probability is equal to 1, the model specifies only *C-1* cumulative probabilities. The parameters α_c are the cutpoints that are in increasing order.

3.2 Measures and variables

Following the first hypothesis, the key factor included in the model is the migration history, in which two variables have been introduced to interpret the impact of spatial

mobility on entrepreneurial motives. It should be noted that the study focuses on mobility capacity and experiences instead of mere possession of migration status. Hence, the first variable is to identify the spatial mobility experiences since becoming an adult, which enable the accumulation of locational knowledge and adaptation into the new regional environment. We further employ the number of migrations within China to measure the degrees of individual spatial mobility and the extent to which the individuals possess multi-location knowledge.

Table 1 Definition of dependent and independent variables

Model Variables	Meaning	Source
Entrepreneurial motives	1= No employment opportunities; 2 = No employment opportunity but seize a good entrepreneurial opportunity; 3 = Have employment opportunity but seize a good entrepreneurial opportunity; 4 = Employment opportunity is good, but the entrepreneurial opportunity is even better	CLDS
Personal attribute		
Gender (GENDER)	Dummy, 1=male, 2=female	CLDS
Age (AGE)	Age when becoming entrepreneurs, 1=younger than 25, 2=between 25 and 44, 3= 44 and older	CLDS
Education (EDU)	Level of educational attainment, 1=junior middle school and below, 2=high school/technical school, 3=college degree or above	CLDS
Local personal network (LNETWORK)	Number of local friends and acquaintances which could support and help	CLDS
Migration status (MIGRATE)	1) 1= have migrated from the age of 14, 0 otherwise 2) Number of an individual's migrations 3) 1=born in a migrant family, 0 otherwise	CLDS
Regional environment		
GDP per capita (PGDP)	GDP per capita	NBSC
Regional knowledge	Number of certified patents (Unit: 10,000)	CNIPA

stock (CIPATENT)		
Potential pool of young skilled labor (YSLABOR)	Number of graduated HE students (Unit: 1,000,000)	NBSC
Average firm size (AFSIZE)	Average number of firm employees per firm in the region	NBSC
Transportation access (TACCESS)	Cargo traffic volumes measured in tons (Unit: 1 billion tons)	NBSC
Foreign direct investment (FDI)	The bulk of foreign direct investment (Unit: 1 billion dollars)	NBSC

The explanatory variables also include factors at the individual level as the control variables. It first considers the demographic feature of the individuals, including gender, age, and education level. More importantly, the model includes the embeddedness in local social networks, measured by the number of reliable friends in the city region, which could capture the trade-off between local embeddedness and non-local knowledge for the entrepreneurs.

Based on the theoretical discussion, six variables are employed to reflect the regional entrepreneurial environment. All regional variables have been calculated as the average value within the last three years since the individuals become self-employed or employers. The first one is the GDP per capita, used to proxy for income level in the city region that nurture entrepreneurial opportunities form the demand side. From the supply side, regional knowledge stock is included based on the knowledge spillover theory of entrepreneurship. Thereby, the patent number in the region is constructed as an indicator of exploitable knowledge ready for recombination and commercialization in the market. The indicators to proxy the development of the regional entrepreneurial ecosystem, as already discussed in the theoretical part, concern mainly the firm ecology and labor pool of young people. The model uses the average size of firms to reflect firm ecology in the city region. The second indicator is measured by the number of students in higher education. For the last set of explanatory variables representing the extra-local linkages of the city regions, I first include transportation access to gauge the size of domestic market potentials. Transportation studies suggest that cargo traffic volume reflects the size of the market the local products serve (Kuby and Reid 1992; Lakew

and Tok 2015). Therefore, cargo traffic volume is used here to represent the extent of market and transportation access to wider market areas. Moreover, the bulk of foreign direct investment is included in the model to testify Hypothesis 4b.

4. Results

4.1 Descriptive analysis

Before the regression modeling, descriptive analysis of employment status and entrepreneurs' characteristics has been made. Table 2 compares the employment status between migrant and non-migrant in the CLDS dataset and found no difference between these two groups in terms of employment status. For both migrants and non-migrants, about one-fourth of the population is currently or previously engaged with entrepreneurial activities.

Table 2 Employment status of migrants and non-migrants

Employment status	Migrant		Non-migrant	
	Number	%	Number	%
Employers	306	11%	544	9%
Currently self-employed	379	14%	827	14%
Current employees with entrepreneurial experiences	93	3%	174	3%
Current employees without entrepreneurial experiences	1945	72%	4280	74%
Sum	2723	100	5825	100

Further analysis of the socio-demographic and entrepreneurial motives of migrant and non-migrant entrepreneurs, however, starts to unravel a divergent pattern (Table 3). Female migrants are more entrepreneurial than their counterparts with no spatial mobility history. Also, migrant entrepreneurs are more educated than non-migrant entrepreneurs. The fact that highly skilled and educated migrants are more entrepreneurial might owe to their reliance on alumni network, other than the local personal network via family members, to gain legitimacy and access resources in their entrepreneurial endeavors (Zou and Zhao 2014; Yoon et al. 2015). In addition, the average number of reliable local friends is almost twice by non-migrant entrepreneurs as that owned by migrant entrepreneurs. It demonstrates the local embeddedness

through personal networks is much stronger for the locals as compared to the migrants.

Table 3 Comparison between migrant and non-migrant entrepreneurs

	Migrant entrepreneur		Non-migrant entrepreneur	
	Number	%	Number	%
Socio-demographics				
Younger than 25	155	26%	257	25%
Between 25-44	386	65%	651	62%
Male	355	60%	673	65%
People attaining high school/technical school	154	26%	241	23%
People attaining a college degree or above	105	18%	132	13%
Local personal network (*average*)	9	—	17	—
Reasons for becoming an entrepreneur				
No employment opportunities	240	40%	517	49%
No employment opportunity but seize a good entrepreneurial opportunity	84	14%	133	13%
Have employment opportunity but seize a good entrepreneurial opportunity	222	38%	343	33%
Employment opportunity is good, but the entrepreneurial opportunity is even better	46	8%	50	5%
Sum	592	100	1043	100

Interestingly, migrant entrepreneurs start their business that are more driven by seizing and exploiting entrepreneurial opportunities. Table 3 shows that 46% of migrant entrepreneurs, compared to only 38% of the non-migrant counterparts, become self-employed or employers in spite of decent job offers. It became evident that migrants' capacity of spatial mobility and multi-location knowledge poses as a unique advantage for entrepreneurship. It should be noted that CLDS also records work history in the survey, but there are a considerable number of missing answers. Among the 592 migrant entrepreneurs in the sample, 360 have given concrete answers on their work history. From this available data, 86% of the migrant entrepreneurs have a work history in more than one city region before starting up in the present location. That means most of the migrant entrepreneurs do not only have the family network and contextual knowledge

in other locations, but more importantly, the professional network and specific industry knowledge accumulated elsewhere.

4.2 Regression results

To begin with, the regressions include the whole sample, including migrants and non-migrants. The significant value of the chi-square likelihood ratio for the models is within the 99.9% of confidence level, confirming the fitness of the model as a whole than empty ones. The first and second variable representing the migration history enter the model separately, mainly because there is a highly significant correlation between these two variables (correlation coefficient = 0.8, $p<0.001$). In fact, the second variable is a refinement of the first one, further reflecting the breath of non-local knowledge through multiple migrations.

Compared to Model 1 in Table 4, the Akaike Information Criterion (AIC) has become lower in Model 2 and Model 3, which demonstrates that the model fit improved when adding migration-related variables. From the coefficients, it could be inferred that individuals having migrated to other places from the age of 14 are more inclined to become opportunity-driven entrepreneurs than their counterparts with no migration experiences. Also, the third model indicates that the more cities they have had experiences as a migrant from the age of 14, the more likely they start opportunity-driven businesses. It presents robust evidence supporting the effect of multi-location knowledge and networks on fostering high-quality entrepreneurial activities. This has corroborated Hypothesis 1, suggesting that the non-local knowledge that has been accumulated through life experiences of spatial mobility drives the entrepreneurs to commercialize unexploited opportunities, rather than start a business purely for survival. In line with previous studies (Dahl and Sorenson 2009), the whole sample model has also confirmed the importance of local embeddedness on entrepreneurial motives, albeit with a weaker effect than the experiences of migration.

Table 4 Ordered logit regression on entrepreneurial motives (whole sample)

Independent Variables		Model 1	Model 2	Model 3
Personal attribute				
GENDER		-0.21**	-0.22**	-0.21**
		(0.10)	(0.10)	(0.10)
AGE	Between 25-44	-0.19*	-0.20*	-0.19*
Ref.=younger than 25		(0.11)	(0.11)	(0.11)
	Older than 44	-0.52***	-0.51***	-0.50***
		(0.18)	(0.18)	(0.18)

		(1)	(2)	(3)
EDU Ref.=junior middle school and below	High school /technical school	0.38*** (0.12)	0.38*** (0.12)	0.38*** (0.12)
	College degree or above	0.94*** (0.14)	0.94*** (0.14)	0.94*** (0.14)
NETWORK		0.02* (0.01)	0.02** (0.01)	0.02** (0.01)
MIGRANT1		—	0.23** (0.10)	—
MIGRANT2		—	—	0.13** (0.05)
Regional environment				
PGDP		0.03*** (0.01)	0.02** (0.01)	0.02** (0.01)
CIPATENT		-0.03 (0.12)	-0.04 (0.12)	-0.03 (0.12)
YSLABOR		-0.23 (0.32)	-0.22 (0.32)	-0.17 (0.33)
AFSIZE		-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
TACCESS		0.79* (0.45)	0.80* (0.45)	0.82* (0.45)
FDI		-0.03 (0.04)	-0.03 (0.04)	-0.03 (0.04)
Number of observations		1635	1635	1635
Likelihood ratio test		0.000	0.000	0.000
AIC		3601.6	3598.6	3597.8

Notes: Standard Errors are reported in parentheses

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

In addition, the regional environment is also related to the motives for starting a business. Among others, the demand side factor, the firm ecology, as well as the transportation access all exert a certain impact on the quality of start-up activities in the surveyed population. The supply-side factor, embodied as the regional knowledge stock, does not push the entrepreneurs towards the end of opportunity-oriented motivations. It might be related to the relatively low quality of patents and the low level of industry-university linkages in China (Kroll and Schiller 2010), leading to underestimation on the value of patented knowledge among local nascent entrepreneurs. According to the regressions, it is also shown that city regions that are comprised of smaller firms in the organizational ecology, rather than those with higher availability of young skilled labor, constitute a more essential part for a functioning ecosystem that fosters opportunity-driven entrepreneurship within the Chinese context. The extent to which the city region could reach out to the wider domestic market via well-connected transportation, rather than the degrees of its connection with foreign investors, contributes to the fundamental extra-local dynamics underlying the entrepreneurial processes.

Table 5 further compares how the entrepreneurial motives of migrants and non-

migrants are affected respectively. Again, the AIC values in models with regional variables are all lower than those without, suggesting that accounting for regional factors improves the model fit. Based on the previous results, migration experience from the age of 14 is used to divide the sample into migrant and non-migrant. It is interesting to find out that local personal network is not a determining factor in the motivation to start businesses for migrants, as shown in Model 5, as it is for the non-migrant group (Model 7), which again corroborates the value of non-local knowledge for migrants to compensate for their lack of local embeddedness. In conjunction with the stronger local personal network by the locals, as shown in Table 3, it also supports the idea that local embeddedness is a key asset for the locals entering into opportunity-driven business. This is generally in line with Martynovich (2017)'s conclusion that local embeddedness and non-local knowledge substitute each other in entrepreneurial activity.

Table 5 Ordered logit regression on entrepreneurial motives (by migrant groups)

Independent Variables		Migrant		Non-migrant	
		Model 4	Model 5	Model 6	Model 7
Personal attribute					
GENDER		-0.20	-0.19	-0.23*	-0.23*
		(0.16)	(0.16)	(0.13)	(0.13)
AGE	Between 25-54	-0.11	-0.07	-0.24*	-0.26*
Ref.=younger than 25		(0.18)	(0.19)	(0.14)	(0.14)
	Older than 54	-0.45	-0.34	-0.55***	-0.59***
		(0.32)	(0.32)	(0.21)	(0.21)
EDU	High school	0.62***	0.61***	0.29**	0.26*
Ref.=junior middle	/technical school	(0.19)	(0.19)	(0.14)	(0.14)
school and below	College degree or	1.24***	1.24***	0.78***	0.74***
	above	(0.22)	(0.23)	(0.18)	(0.19)
NETWORK		0.04	0.05	0.02*	0.02*
		(0.04)	(0.4)	(0.01)	(0.01)
Regional environment					
PGDP		—	0.03**	—	0.01
			(0.01)		(0.02)
CIPATENT		—	0.11	—	-0.32
			(0.14)		(0.21)
YSLABOR		—	-0.31	—	-0.09
			(0.53)		(0.43)
AFSIZE		—	-0.02	—	-0.04**
			(0.02)		(0.01)
TACCESS		—	1.22*	—	0.41
			(0.69)		(0.63)
FDI		—	-0.04	—	0.005
			(0.07)		(0.06)
Number of observations		592	592	1043	1043
Likelihood ratio test		0.000	0.000	0.000	0.000
AIC		1354.9	1346.8	2294.2	2268.7

Notes: Standard Errors are reported in parentheses

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

While the locals' entrepreneurial motives are directly influenced by their residing environment, given their history of non-mobility, there is an issue of endogeneity in terms of the interrelation between regional environment and entrepreneurial motives for the migrants. On one hand, the migrants' entrepreneurial motives could be triggered and inspired by their currently residing environment. On the other hand, the formation of migrants' entrepreneurial motives could precede the migration and they are attracted to and anchored in a city region that match their locational preference for starting up. Bearing it in mind, the empirical results should be carefully interpreted in terms of the association, other than causality, in the case of migrants. Comparing the coefficients and significance level of the regional variables in Model 5 and Model 7, migrants' entrepreneurial motives are obviously related to the regional environment in a different manner from the non-migrant ones. Firstly, the wealthier the city region is, the more likely a migrant entrepreneur would be driven to opportunity-based businesses rather than the necessity-based one. While Hypothesis 2a has been corroborated, Hypothesis 2b is not supported. This might imply that opportunity-driven entrepreneurship in China is more based upon incremental innovation aimed for exploiting the huge market potentials, and less through radially introducing new products with the commercialization of patented ideas. Secondly, regional business ecology, whereby firms are organized in a smaller scale, is likely to trigger more opportunity-based entrepreneurship among the local residents. This has supported Hypothesis 3a, whereby SME-dominated firm ecology benefits the local individuals in pursuing opportunity-based business, partly owing to their long-term exposure to the entrepreneurial culture and established networks during the local work experiences. Nevertheless, Hypothesis 3b could not be supported, meaning that neither migrants or locals' opportunity-driven entrepreneurship are related to the local availability of young talents, which could be attributed to the attractiveness of large firms to newcomers in the Chinese labor market. Last but not least, the regional access to the wider domestic market, proxied by transportation connectedness, is significantly positive with migrant's entering into opportunity-based entrepreneurship. While Hypothesis 4a has been validated, Hypothesis 4b about the effect of FDI is not supported. One possible explanation could be the thin embeddedness within the Chinese host cities whereby foreign ventures tend to network among themselves (Wei 2015). While that could be used to account for the

limited range of knowledge spillover from foreign ventures, there is still evidence supporting the role of FDI inflows in overcoming institutional barriers in reforming state-owned enterprises in coastal regions of China (Wei 2015; Zhu et al. 2019). As our database covers all Chinese city regions, the inclusion of inland regions, whereby FDI has a limited scope of interaction with governmental institutions, could potentially offset the relationship hypothesized previously.

5. Discussion and Concluding remarks

Migrants are the knowledge carriers and network builders, and their mobility experience ensures the capacity of cities and regions to insert within the multi-location and multi-scalar processes of knowledge accumulation (Crevoisier and Jeannerat 2009). Yet no study, to the best of our knowledge, has contrasted the entrepreneurial motives between migrants and non-migrants. This study follows a multi-level and novel dataset combining nationwide information on individual migration history and regional environment. There is clear evidence of the higher prevalence of opportunity-driven entrepreneurship in migrant entrepreneurs. Furthermore, the regression practice has shown that mobility experiences outweigh local personal network in terms of promoting the likelihood of starting the opportunity-based business. While previous studies have focused on the effect of multi-location experiences and spatial mobility on entrepreneurial entry and performance (Frederiksen et al. 2016; Martynovich 2017; Liu et al. 2019), the study adds up to this line of thinking by validating its role in promoting the entry into the opportunity-driven business. As a result, the migrant-targeted entrepreneurial policy should be acknowledged by policymakers in the knowledge economy aiming for promoting productive entrepreneurship.

Although sufficient studies in regional entrepreneurship have been done to outline the structural conditions that nurture and foster entrepreneurial activities (Feldman et al. 2005; Stam 2015; Audretsch and Belitski 2017), little has been known about the complexity of the economic agents in the entrepreneurial system. As pointed out by Audretsch and Keilbach (2008), the potential economic value of regional knowledge stock is asymmetric across economic agents. This implies that economic agents might possess distinctive perceptions of and accesses to the specific bundle of regional entrepreneurial resources. As such, another contribution of this study lies in demonstrating a potentially distinctive mechanism, in effect through spatial mobility of

entrepreneurial agents, underlying the processes of regional entrepreneurship. Local entrepreneurs are more influenced by the endogenous nature of firm ecology in the city, whereas migrant entrepreneurs start a business driven by both local income level and extra-local connectedness to greater market areas. In spite of the lower embeddedness in the regional entrepreneurial ecosystem, the migrants are capable of exploiting the value of non-local knowledge by capitalizing on the extra-local dynamics of the resided cities.

The results provide certain insights into studies on the entrepreneurial cluster in light of the complementarity between the internal ecosystem and external connection. Other than the long-emphasized endogenous nature of ecosystem for entrepreneurship, the regional connectedness to the external market is beneficial for attracting or triggering migrant entrepreneurship, injecting new knowledge dynamics and enlarging the size of local start-ups. Consequently, a growing SME-dominated firm ecology motivates the socially-embedded locals to exploit opportunity-driven business. Thereby, city governments should not only try to promote the performance of entrepreneurial ecosystem but also invest in strengthening outward connectedness, which could potentially add up to the self-reinforcing dynamism of the entrepreneurial ecosystem. Also, if the city governments are to make the most out of the massive investment in establishing an entrepreneurial ecosystem, they should also make efforts in assimilating migrants and enhancing their embeddedness. Hence, ecosystem policy should be inclusive to engage the migrants with the untapped pool of local knowledge and networks.

The study opens up several areas of future research. It is exploratory in investigating the way that regional environment affects migrants and non-migrants. Future study may wish to consider a complete set of facilitating factors in the city regions. As suggested by this study, a useful extension would be to systematically differentiate endogenous and exogenous factors for regional entrepreneurship. But such an investigation should be guided by an endogenous-exogenous cross-strengthening framework, and make the inquiry into the varying complementarities between endogenous and exogenous regional factors among individuals with varying experiences of spatial mobility. Second, it is worth testing the relationship between spatial mobility and opportunity-driven entrepreneurship within contexts of both advanced economies and emerging economies. The results of the study are derived against the context of transition and emerging country, China, whereby the business environment is not well-developed and market

institutions ill-defined. At this developmental stage, it is plausible that many regional factors, such as foreign direct investment and availability of talents, are not brought into full play. The strong presence of Chinese state-owned enterprises has put both domestic SMEs and foreign ventures at a disadvantaged position in terms of competing for talents and influencing the rules of games in the industry. Therefore, it requires the adaption of the regional entrepreneurship literature, developed within the context of market economies, to the context of transition and emerging economies. In particular, the extent to which institutional change and reform towards market-based economies potentially mediates the relationship between regional entrepreneurial environment and opportunity-driven entrepreneurship.

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