

Challenges for High-skilled Chinese Returnee Entrepreneurs

-A case study in Nanjing

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Abstract

The transition of Chinese economy necessitates technology transfer by attracting high-skilled returnees under policy intervention. In this research, I have described the challenges encountered by high-skilled Chinese returnee entrepreneurs in Nanjing, a representative second-tier Chinese city which is adopting the policy-driven talent-attracting model. By applying qualitative methods, I have enriched the understanding of the challenges for these returnee entrepreneurs, which originates from the existing body of literature on return migration and technology catch-up. It is found in Nanjing that recruited returnee entrepreneurs frequently face non-economic challenges as well as economic challenges because the institutional governance of science and technology in Nanjing is still immature. Besides, their non-economic challenges intertwine with economic challenges, as a result of multiple influences from social, cultural, political, and geographical factors. I provide policy advice that local states in China should establish a transition in governance for innovation through various approaches.

Keywords: Challenges, Chinese returnees, Technology catch-up, The Chinese policy-driven talent-attracting model.

1. Introduction

The 2018 China-United States trade war has, once again, alarmed the Chinese state to promote technology catch-up. The Chinese economy, which currently lacks “indigenous innovation capacities”, is facing the necessity of profound transformation (Zhang, 2012). An essential approach for technology catch-up is to attract high-skilled Chinese returnees through state intervention policies (Wong, 1999), such as “*the Thousand Talents Plan*” which was initiated in 2009. Since, the last decade has witnessed an increasing reverse of “brain drain” to “brain gain” (Saxenian, 2006) during an unprecedented trend of return migration to China. Via boosting investment in science and technology as well as providing incentives for high-skilled entrepreneurs, this governmental-motivated recruitment has successfully achieved an annual growth of 12% in the number of Chinese returnees since 2014 (the State Council of China, 2017).

Among all Chinese returnees, high-skilled returnee entrepreneurs are supposed to play the critical role for technology catch-up. Referred as the “return of innovation” (Garvin, 2006), this process often involves challenges as their acquired skills could be wasted due to local constraints (Cassarino, 2000). Pilot researches studying Chinese technology transfer have also discussed challenges related to human capital in Shanghai’s biopharmaceutical industry (Sternberg, 2010). A similar case study in India has suggested the market-oriented reform of the domestic economy may lead to challenges for returnee entrepreneurs in emerging Asian countries, too (Kumaraswam, 2012).

Meanwhile, policy-driven return migration of high-skilled entrepreneurs has been rarely studied in with city-level details. Among current technology catch-up researches in the Chinese context, case studies have been merely selected in Shanghai, one of four top-tier Chinese cities. The Shanghai case has presented an insufficient sample among all the Chinese cities that are adopting incentive-driven talent-attracting policies, including approximately 40 emerging second-tier cities (Li, 2014; Wu, 2016). Moreover, challenges faced by individual returnees, and challenges related to the development of a certain RIS (Regional Innovation System), are often mixed in the existing body of literature.

I have narrowed these gaps in this research by studying a representative second-tier Chinese city, Nanjing, which is applying a typical policy-driven talent-attracting model that is becoming prominent among second-tier Chinese cities (Li, 2014). Besides, by conducting qualitative approaches, I have looked into the challenges perceived by high-skilled returnee entrepreneurs from their individual perspectives, which is a lack of existing studies. Choosing high-skilled returnee entrepreneurs in Nanjing as target interviewees, I have centered my field work on this main research question:

- ***What are the challenges for high-skilled returnee entrepreneurs in Nanjing, who have been introduced by talent-attracting policies?***

In this research, I conclude that both non-economic challenges and economic challenges have brought constrains for high-skilled returnee entrepreneurs in Nanjing. Although non-economic challenges are supposed to be outweighed by returnee entrepreneurs’ favor of economic benefit, they would intertwine with economic concerns, too. For enterprise development, human capital reasons and transition of the Chinese economy have brought in major economic challenges. It is

suggested by the interviewees that the institutional governance of science and technology in Nanjing is still immature. Multiple influences from social, cultural, political, and geographical aspects contribute to these challenges for high-skilled returnee entrepreneurs.

This paper is structured as follows. In section 2, I have reviewed the existing body of literature about challenges for high-skilled Chinese returnee entrepreneurs. Reviewed studies mainly origin from theories in return migration and technology catch-up. I have then developed a preliminary theoretical framework in this section. In section 3, I have introduced the research methods as well as the settings of this case study in Nanjing. In section 4, I have presented the results of this research. In section 5, I have discussed the findings and revised the theoretical framework. I have summarized the main conclusion of this research in this section. As well, I have reflected on the limitation of this research, with policy implications as its societal contribution.

2. Theoretical background

2.1—Structuralism theory of return migration: non-economic challenges for returnee entrepreneurs

A fundamental overview of return migration by Cassarino (2004) provides us with five approaches to theorize return migration: *neoclassical economics, the new economics of labor migration, structuralism, transnationalism and social network theory*. A shift from *success/failure paradigm* towards *core-periphery dichotomy* is observed. Cassarino (2004) argues that both neoclassical economics and the new economics of labor migration tend to isolate the decisions of the returnees from their social and political environment, solely see return migration as an outcome of failed or successful experiences abroad (Todaro, 1969; Stark, 1991). A shift in paradigm, which draws the line between the modern countries of immigration and the traditional countries of origin of the returnees, contributes to the formation of the latter three theories. It is emphasized in structuralism, transnationalism and social network theory that non-economic factors need to be taken into account when studying return migration. Respectively these non-economic factors are situational or contextual factors in origin countries (Dumon, 1986); common ethnicity, the common origin and kinship linkages (Brand, 2002, 6; Leichtman, 2002); and the composition of networks consisting of a multiplicity of social structures (Eccles and Nohria, 1992).

Considering the increasing diversity of migration categories to theorize, a universal definition of “returnee” is difficult. In structuralism theory of return migration, returnees are defined as “people who, in order to be re-accepted, have to re-adapt to the changed cultural and behavioral patterns of his community of origin” (Dumon, 1986, p.122). The structuralism definition of returnee is then classified into four categories by Cassarino (2004). One of them is the migrants during the “*return of innovation*”, which mainly includes the return migration of *high-skilled migrants* (Lowell, 2001) and *entrepreneur returnees* (Cassarino, 2000). These economic returnees are supposed to become actors who are prepared to utilize the new skills they have acquired during their migratory experiences (Cerese, 1974), with a purpose to achieve their goals in origin countries. The structuralism definition of returnees during their “return of innovation” corresponds to those researches choosing high-skilled returnee entrepreneurs as target people. For instance, the structuralism definition of returnee has been applied in a pilot research on those who run new knowledge-based firms in Shanghai by Sternberg (2010).

Both Sternberg (2010) and Chen (2017) find that high-skilled returnees with long-time overseas experiences occasionally face structural challenges. When high-skilled returnee entrepreneurs attempt to re-integrate into local networks, they struggle with their “liability of foreignness” (Chen, 2017, p.1348). Seen as typical challenges by Zhang (2010) based on the core-periphery dichotomy, these non-economic challenges mainly result from *structural constraints* inherent in origin countries (Cassarino, 2004). Encountered by these challenges, returnees’ expectations are usually re-adjusted and re-adapted to the structural context at home. Meanwhile, the social status of these high-skilled returnee entrepreneurs may not change (Lowell 2001). These non-economic challenges for returnees are frequently regarded as challenges brought by contextual factors, such as cultural causes or institutional relationships under specific contexts (Cassarino, 2004).

However, the structuralism theory argues that non-economic challenges caused by contextual factors are supposed to be overcome by high-skilled or entrepreneur returnees, who are expected to be highly motivated to return (Cassarino, 2004). As theories on return migration mostly put their focus on motivation, the structuralism theory, at the very beginning (Dumon, 1986), sees non-economic challenges as complementary parts to enrich the “success/failure” paradigm (Stark, 1991). Drawn on core-periphery dichotomy, it is argued that migrants are believed to have a high level of *resource mobilization* and *returnee’s preparedness* for a successful return (Cassarino, 2004). For high-skilled or entrepreneur returnees, their perception of significant institutional, economic or political changes that have occurred at home helps to improve their return motivation (Cassarino, 2004; Iredale, 2001).

In structuralism theory of return migration, it is assumed that high-skilled entrepreneur returnees would *favor economic opportunities* (Lowell, 2001), including professional promotion and economic opportunities. High-skilled returnee entrepreneurs are supposed to find solutions to non-economic challenges because their return migration was well prepared. Structural challenges could, at least partly, be “pre-calculated”, thanks to the development of modern communication technology and state-organized events (Cassarino, 2004). As a result, situational or contextual constraints are considered just as “differences” once the returnee is able to “re-adapt” to local cultural and behavioral patterns.

Structuralism theory of return migration concentrates on the situational factors in origin countries, such as local power relations, traditions, and values (Cassarino, 2004). This leads to the argument that structuralism tends to limit the experiences of migration of the returnees to the mere acquisition of knowledge or skills. That is to say, the returnees did not significantly change *old values*. Rather, they tended to reinforce original values (Colton 1993). Unchanged or even reinforced old values help to tackle non-economic challenges, for example, cultural challenges (Cassarino, 2004).

2.2—*Technology catch-up and state intervention policies: economic challenges for returnee entrepreneurs*

Fransman (1986, p.7) defines the international ‘transfer of technology’ as a process “whereby knowledge relating to the transformation of inputs into outputs is acquired by entities within a country from sources outside that country”. Such a process during globalization which benefits the latecomers based on core-periphery dichotomy is defined as “*technology catch-up*” (Mathews,

2002). Radosevic (1999) has summarized several channels for international technology transfer and catch-up. In his study emerges an early recognition of “transferring technology by people” as a channel for technology catch-up, which focuses on the “organizational innovations” because of their high tacit component through “brain drain, brain gain, visits, and exchanges, etc.” (p. 27).

The comparative analysis of technology catch-up in Korea, Taiwan, and Singapore by Wong (1999) suggests a tendency of strong path dependency of domestic industries, which leads to his belief that *state intervention policies* should play an important role in the catch-up process. In the 21st century, what Wong (1999) regards as national state intervention policies have become prominent in the once “periphery” Asian countries (Saxenian, 2006). One typical example of technology catch-up under state intervention policies is the case of U.S.-educated Taiwanese returnees in the 1980s. These Taiwanese returnees have coordinated a process of reciprocal industrial upgrading by transferring capital, skill, and know-how from the Silicon Valley to the Hsinchu-Taipei region (Saxenian, 2001).

The emphasis of these state intervention policies is the focus on building human capital (Kenney, 2013) by bringing in high-skilled returnees. Human capital, a strong base of skilled workers with a high level of college graduates, has been suggested as the reliable source of long-run comparative advantages (Glaeser, 2005). As these expatriates studied and worked abroad, they absorbed technical expertise, managerial and entrepreneurial skills (Filatotchev, 2011; Dai, 2009). Wadhwa (2011) sees the knowledge brought back by Taiwanese returnees as a key factor that helps to improve the local technological, organizational and territorial climates. High-skilled returnee entrepreneurs facilitate both direct technology transfer (Pruthi, 2014) and indirect technology spillovers (Sternberg, 2010) to local firms. They have extensive contacts with scientists who are integrated into global markets and possess the linguistic and cultural skills to work in their home country as well (Sternberg, 2010). Their contribution is described as “the travel of tacit knowledge” (Oinas, 2002). While the codified knowledge is often proxied by the number of patents, publications, and citations, tacit knowledge is often embodied in human capital (Ghio, 2015).

During technology catch-up, a common type of economic challenges regarding human capital is the *lack of absorptive capacity*, which leads to insufficient spillover effect (Zhang, 2015; Filatotchev, 2011). The term “absorptive capacity” refers to the ability to value, assimilate, and utilize new external knowledge (Lane, 1998). Cohen and Levinthal (1990) have considered the level of prior related knowledge as the determinant of absorptive capacity. Local universities and firms in the developing countries are found to lack proficient level of prior knowledge, as a result of insufficient professional labors (Kenney, 2013) and the weak connection between research agents (Zhang, 2011). Returnee entrepreneurs not only fail to utilize their acquired advanced technological expertise but lose the opportunities to enhance long-term spillover effect with non-returnee firms as well (Filatotchev, 2011).

The transition in emerging Asian economies also brings challenges, despite the market liberalization has spurred significant changes to accelerate the process of technology catch-up (Kumaraswam, 2012). A major one is the controversial role of *government forced economic assistance* (Kleer, 2010; David, 2000). On the one hand, it is generally believed that public incentives play the significant role for local R&D development in the early formation of local innovation network (Pyka,

2002). On the other hand, the directive state-sponsored model has been criticized by Bresnahan (2001) and Wallsten (2001). They argue that “the economic factors that give rise to the start of a cluster can be very different from those that keep it going.” (p.835). Detail-level directive jump-start policies, such as picking the specific industries or technologies to be sponsored, may only lead to the growth in the number of firms. However, it is the growth of companies, not just the growth in their number, is the signal of successful technology catch-up (Bresnahan, 2001)

2.3—Challenges for High-skilled Chinese Returnee Entrepreneurs

Since the promulgation of “*the Thousand Talents Plan*” in 2009, high-skilled returnee entrepreneurs have formed a sizable group among the returnees attracted by Chinese talent programs and policies (the State Council of China, 2017). Many of these high-skilled returnee entrepreneurs have encountered challenges during their “return of innovation” (Garvin, 2006; Cassarino, 2000). The word “challenge” is used in business English as well as in Chinese policy documents when describing “a job, duty, or situation that is difficult because a lot of effort, determination, and skill must be used in order to be successful” (Cambridge English Dictionary). The word “challenge” does not only refer to an incident or actor that may hinder growth thus cause constraint (Garvin, 2006) but also implies the opportunity of success (e.g. in *Made in China 2025*) if some great effort has been paid.

■ *Non-economic challenges: the structuralism theorizing approach*

Non-economic challenges for Chinese economic return migrants have been rarely discussed in the existing body of literature, except one by Sternberg (2010) in his supplementary summary of Shanghai’s biopharmaceutical industry development. The *structuralism theory of return migration* is argued to provide a convincing approach for describing high-skilled Chinese returnee entrepreneurs (Sternberg, 2010) while both transnationalism and social network theory fail to characterize the Chinese returnees to some extent. The latter two theories suggest that talent “circulates” in their migration process with a flexible identity and citizenship among countries, like Singaporean returnees (Huang, 2015). Such a flexible identity is suggested as inappropriate in China where dual citizenship is prohibited, and a permanent return is recommended (Ho, 2011).

Return migration for Chinese is frequently regarded as the ending part of a whole migration project, instead of an impermanent circulatory one. A possible explanation is that Chinese returnees want to avoid the Chinese ‘citizenship dilemma’, as residency, employment, and social rights are not conferred without hukou, also known as the Chinese registered permanent residence (Ho, 2011). Therefore these high-skilled Chinese returnees during their “return of innovation” are argued to possess a relatively higher level of return motivation, including both *resource mobilization* and *returnee’s preparedness*. In other words, as the structuralism theory implies, non-economic challenges for Chinese returnees are supposed to **be overcome by economic benefit** (Lowell, 2001).

■ *Economic challenges: human capital challenges*

Although what Wong (1999) regards as state intervention policies have been adopted at the national level, China’s attempt to catch-up in technology has been fundamentally different from earlier latecomers (Lu, 2008). For instance, Mu (2005) describes the Chinese telecommunication industry catch-up as a “*stage-skipping catch-up*” (p.759). A similar description is found in Sternberg’s (2010)

study on the transformation of Shanghai's biopharmaceutical industry: "Returning entrepreneurs are uniquely positioned to utilize location-specific advantages in two parts of world...by dividing the innovation process into the knowledge production phase (located in more advanced innovation systems abroad)...and the commercialization phase in Shanghai." (p.103). Rather than human capital building, it is imitation and advanced infrastructure considered by its low cost, that function as key elements in Chinese technology catch-up strategies (Lu, 2008; Sternberg, 2010).

In China, large pools of highly educated global-class professionals and engineers had not yet been created (Kenney, 2013). Case studies in both Shanghai Zhangjiang High-Tech Park and Beijing Zhongguancun Science Park suggest that the gap of local talent pool may cause *the lack of absorptive capacity*, or absorption constraints (Zhang, 2015; Filatotchev, 2011), because prior knowledge has hardly been created by either Chinese universities (Zhang, 2011) or local established firms (Lu, 2008). The link between Chinese university, research institutes, and industries is generally weak. Research programs are connected with the government funding body vertically rather than horizontally among research institutes and firms (Zhang, 2011). Besides, the GDP-oriented development advocated by the Chinese state, with a low level of cost in land price, resources, and pollution, has driven Chinese technology companies to take advantage of the business model where the cooperation between research and industry is ineffective (Lu, 2008). As a result, both Chinese universities and firms fail to reduce the *shortage of human capital* in improving absorptive capacity, because "there is more development than research" (Zhang, 2010, p.532).

Some scholars, on the other hand, believe that China's universities indeed generate some knowledge that should be able to improve "absorptive capacity", but in the mismatched field (Cui, 2010; Chen, 2017). The *mismatch* between skills and knowledge acquired by returnees, and the capacity of local human capital, then generates economic challenges (Lu, 2008). Studies show that the core capability of Chinese knowledge workers is still the integration capability of market knowledge, outsourcing, and learning. As a result, high-skilled returnee entrepreneurs who intend to run new knowledge-based firms are facing great challenges in employing matched local human capital in their target technology. It is argued that most of the current innovations in China are incremental innovation rather than radical innovation, innovation of new business model, and innovation of flexibility (Lu, 2008). Moreover, Lu (2008) criticizes the Chinese education system for its failure in creating an innovation culture, which leads to the lack of diversity of background in human capital. This diversity of background in knowledge is believed to help returnees to localize their knowledge by bringing organizational mechanisms associated with coordination capabilities (Cohen and Levinthal, 1990).

To clarify in this research, I define that *human capital shortage* refers to the constraints in the quality of human capital which result in returnee entrepreneurs' failure to utilize and put into production their advanced knowledge, whereas *human capital mismatch* emphasizes on the difficulties for them to employ knowledge workers within their target research field.

■ *Economic challenges: transitional challenges*

Since the market-reform in 1994, the transitional Chinese state and domestic market frequently bring economic challenges for enterprises. In order to promote technology catch-up in such a

transitional economy, it is believed by Zhang (2012) that simply allowing the market logic to dominate innovation cannot help ‘catch-up’, whereas state intervention may lead to inefficiency and the lack of innovativeness. Case studies have revealed that the transitioning process of the Chinese economy has mainly created three types of challenges that may cause economic constraint for high-skilled returnee entrepreneurs.

The economic transition from centrally planned to market-oriented reform brings the first type of challenges, which is about *funding source*. Studies by Sun (2013) reveals that the Chinese capital market is not yet mature. Lack of sustained funding and underdeveloped venture capital lead to the under-performed intellectual property output (Zhang, 2011). For returnees who run private new knowledge-based firms, they always find it difficult to compete for private investment with state-owned enterprises (SOEs) or largescale established firms (Sun, 2013). As an alternative, these returnees rely on state funding as a critical source, which demonstrates a marked dependence upon government support with limited private enterprise support.

Economic incentives provided by local government forces often take the form of tax reduction, publicly financed R&D investment and target-oriented awards (Pyka, 2002). For China, Hu (2001) and Jefferson (2003) argues that providing incentives for enterprises to invest in R&D should be a preferred alternative than providing R&D grants directly, as in China state-owned assets entangle with public incentives. There are also arguments against the incentive-based model which brings more limitations than benefits (Rondinelli, 2000). For instance, public incentives could be directly or indirectly lead to the presence of strong monopoly power in some industries (Mamunea, 1999). Those public incentives may also hinder foreign direct investment (Rondinelli, 2000). Yang (2008) criticizes the Chinese incentive-driven model, saying “...if returnees seek to the state’s administrative power to obtain financing from private institutions, their commercial behavior will eventually transform into political actions. Returnee entrepreneurs cannot rely on themselves, but on governmental support instead.” (p. 60)

Secondly, the transition of the Chinese economy also requires a transition in governance for innovation (Li, 2010), which leads to the challenges related to *the role of the state*. Though “institutional innovation” has already happened in Taiwan with returnee talents as “carriers of change” (Saxenian, 2008; Cassarino 2004), Wu (2015) believes that in China the state will remain at the center of regulatory mechanisms. The Chinese (local) state not only promotes innovative development by making strategic planning and talent-attracting policies but also by providing support to many of the critical components for a RIS (Zhang, 2015).

The directive role of the Chinese state could bring challenges for high-skilled returnee entrepreneurs, as this implies a directive state-sponsored model which has been criticized by Bresnahan (2001) and Wallsten (2001). A different perspective is offered by Zhang (2011), where she suggests “... a hybrid approach to the governance of innovation in China, which combines the developmental state and entrepreneurialism...” (p. 728). Under the transitional background, Zhang (2011; 2012) sees the state as a critical role in the initial stage of concentration in the science park, meanwhile, the global knowledge flow becomes more significant in the later stage.

The third type of economic challenges emerging in recent two decades during the Chinese economic transition is *guanxi*, or the informal connections and social network, particularly referring to *the relationship between private entrepreneurs and public sectors* (Sun, 2013). With the economy undergoing great transition, China’s laws and regulations can be flexibly interpreted and executed, then *guanxi* serves as a crucial mechanism to allocate limited economic resources for commercial competition (Lu, 2008). Returnee entrepreneurs in China are challenged to deal with “the complex bureaucratic rules and politics which regulate private companies” (Saxenian, 2006, p.106). Sternberg (2010) argues that such a strong relationship between public and private actors would hamper industrial restructuring by leading to a “political lock-in”, as path-dependency can hardly be reduced when top-down policies decide the preference from private firms. These economic challenges in *guanxi* require returnees to be equipped with both western high-tech regions experiences and local relationships, as they find it important to secure the support from the local state and bureaucracy (Sternberg, 2010). The “unspoken rules” full of informality within *guanxi* bring great challenges for returnees to get access to the market, or to negotiate with their clients with public power (Cui, 2010).

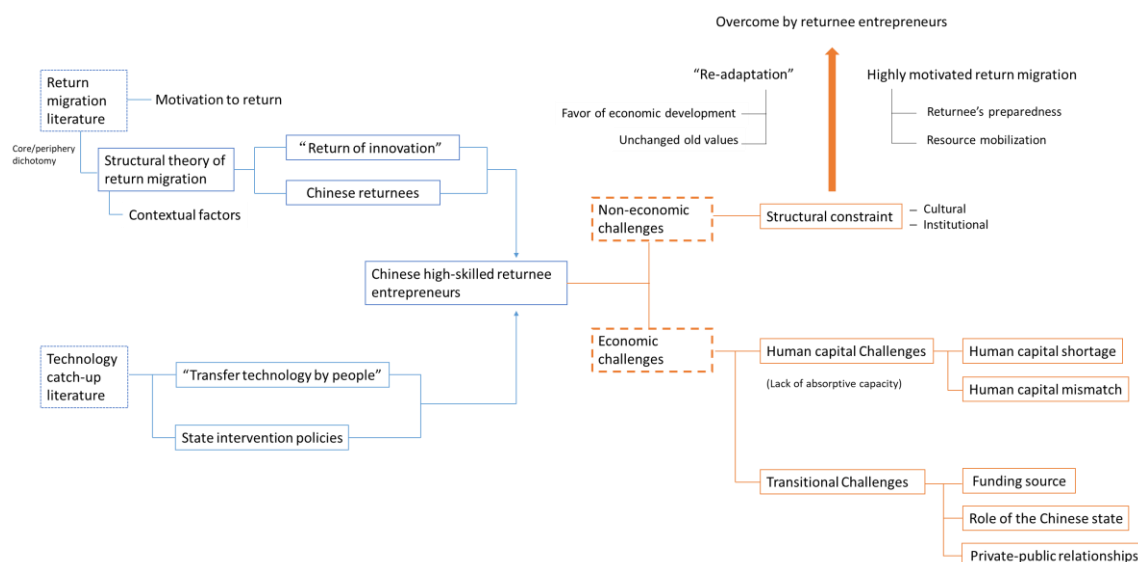


Figure 1, theoretical framework (the orange boxes are the focus of this research)

3. Research methods and settings

3.1—Qualitative methods

Qualitative methods are adopted in this research. To understand the background information of talent-attracting policies and programs promoted by Nanjing local state, I have conducted *content analysis* along with *semi-structured in-depth interviews* with local officials at Nanjing Talent Center. In this research, snowball and gatekeeper strategies are used to recruit entrepreneur interviewees.

The Chinese local talent-attracting programs mainly provide financial incentives and a desirable working environment for returnees (Zhang, 2012). Relevant policy documents in Nanjing contain the national-level “the Thousand Talents Plan”, the provincial-level “High-level Overseas Talents Strategy” and the city-level “321 Talent Program”. Summary of content analysis is outlined in *Appendix I*. The promotion and implementation of these policies has been assessed by policymakers from in-depth interviews with a revised interview guide (See *Appendix III*). Interviews with four

local officials have been finished with a total length of 150 minutes.

Regarding high-skilled Chinese returnee entrepreneurs, the major target people of this research, their opinions have been gathered firsthand. Two qualitative approaches, including *semi-structured in-depth interviews* and *focus group discussion*, have been applied. In-depth interviews have been conducted to get personal and detailed information (Hennink, 2010). These interviews also help to gather radical ideas of individuals, which might not be appropriate to be heard by others. All these interviews have been conducted under the interviewee's full consent, with the guidance of an interview guide which originates from the theoretical background section (See *Appendix II*). The anonymity of confidentiality is promised. In this research, nine in-depth interviews with high-skilled returnee entrepreneurs have been completed with a total length of 470 minutes.

After these in-depth interviews with returnee entrepreneurs, a focus group discussion among four other interviewees have been conducted to get information during an interactive process (Hennink, 2010). Focus group discussion helps to get diverse views or typical cases. The same interview guide (See *Appendix II*) which leads the in-depth interviews is again used to guide this focus group discussion. Common perspectives which have been highlighted in several individual interviews are collected during a 60-minute focus group discussion with four participants.

Details of all nine in-depth interviews and the focus group discussion can be seen in *Appendix IV*.

3.2—*Target interviewees*

In addition to the criteria chosen by Saxenian (2008), the content analysis of talent-attracting policies in Nanjing supports me to provide a definition of targeted returnee entrepreneurs in this research. Generally, these returnees should be entrepreneurs of Chinese origin who have studied in the developed countries, principally with a Ph.D. degree gained from the U.S., European countries, and Australia. These returnees should have founded or co-founded their current knowledge-based firms in China for at least one year. Also, they should have enjoyed the incentives provided by talent-attracting policies or programs after the year of 2009 when “the Thousand Talents Plan” was promulgated.

3.3—*Settings*

Population policies that are aimed to “lure” human capital have sprung up among second-tier Chinese cities (Li, 2010, p.153). In 2018, a trend of adopting new local policies has led to a so-called “talent war”, involving nearly 40 emerging second-tier Chinese cities in this competition for human capital. This research is conducted in Nanjing, a representative second-tier city in China which is in this fierce race for human capital, especially for high-skilled returnees.

As the capital city of Jiangsu province, Nanjing lies in the relatively more developed Yangtze River Delta, south-east China. Nanjing has a population of 8.33 million with a sprawling geographical area of 6,598 square kilometers. In 1994, Nanjing was the first city in China to have a “special zone” planned for bringing in high-skilled returnee talents, which is now known as the Jiangbei Hi-tech Industrial Zone.

Nanjing is a representative second-tier Chinese city that is adopting both incentive-driven programs and spatial planning measures in order to promote innovative development (Zhang, 2015). With the aggregated built area of over 500, 0000 square meters of incubators and production space in science parks and high-tech zones, 3752 high-skilled entrepreneurs have been attracted to Nanjing until 2017. Four Nobel Prize winners, nine academicians, and 348 national qualified high-skilled talents have been recruited (Nanjing Talent Center, 2017). When it comes to local human capital, Nanjing comes third in terms of higher education in China, with 53 universities and over 500,000 college students (Education Department of Jiangsu Province, 2016).



Graph 1, science parks and high-tech zones in Nanjing. Source: Nanjing Talent Center, 2017

4. Results

4.1—Depicting the policy-driven talent-attracting model in Nanjing

Nanjing follows the state intervention model (Wong, 1999) to attract overseas talents. Content analysis of national, provincial, and city-level policy documents, along with in-depth interviews with local officials at Nanjing Talent Center, has assisted to understand how this model works:

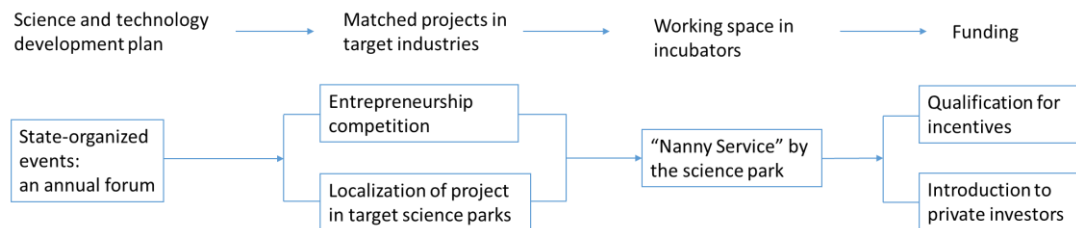


Figure 2, the proposed policy-driven talent-attracting model in Nanjing

First, before overseas talents decide to return, what Colton (1993) and Cassarino (2004) call as “state-organized events” are organized. In Nanjing, these events take the form of an *annual forum* in December since 2009, which introduces hundreds of potential returnees to Nanjing each year. These potential returnees, often with overseas Ph.D. degrees in science and technological disciplines, are supposed to interact with local officials as well as experienced former returnees in this forum. Via face-to-face contacts, these potential returnees are informed of up-to-date information about the

economic concerns in Nanjing. What Cassarino(2004) emphasized as security and political concerns are rarely worried. Attention has been paid to local level rather than national level for their enterprise development. The essential information these potential returnees are noticed is that about the Nanjing science and technology development plan, the strategic planning policies initiated by the central state then detailed by the local. Although a broad body of these plans can be found on the state's website, explanations by officials and former returnees manage to provide precise advice suitable certain returnees. For instance, from 2016 to 2020, the prioritized industries with strategic emphasis in Nanjing's development plan are information industry, biological medicine, renewable energy and new materials, and satellite navigation applications. In this regard, talent-attracting policies improve the returnee's preparedness (Cassarino, 2004).

After that, a "two-way choice" (Nanjing Talent Center, 2017) between returnees and local state creates several groups of potential returnees with expertise in each planned industry. Often, the returnees already have a well-planned idea or a partly finished project when invited to the state-organized forum. For a talent who has an idea, he should further develop it into a proposal containing entrepreneurship programs, then participate in a *competition* among rivals within the same selected industry. For a people with project experiences, he should present his overseas background, work experiences, professional know-how, and entrepreneurship skills. Since 2016, returnees from the latter group with "tangible assets" are favored by the local state in Nanjing, because the projects of them are proved to be more practical to localize (Nanjing Talent Center, 2017). After the competition which is evaluated by officials and university professors, qualified returnees are designated into a certain *science park* or a *hi-tech industrial zone* in Nanjing.

Then, qualified returnee entrepreneurs are provided with "*nanny service*" (Chen, 2010, p.47) by the administrative officials in the science parks where their project is located. A science park serves as an incubator to assist entrepreneurs during their start-up phase. Basic working space is provided, and non-financial assistance by the science park is granted. Afterward, the science park, instead of an individual entrepreneur, comes to the department in Nanjing talent center to apply for *project-targeted incentives* from local talent-attracting policies. Not only direct financial assistance but also incentives in taxation and discount on housing are granted for high-skilled entrepreneurs in Nanjing.

At the last stage directed by the state, qualified returnee entrepreneurs with a semi-mature project are introduced to *private investors* for further funding. The local state serves as the intermediate platform between entrepreneurs and private venture capital. Despite that the state is ostensibly less involved, the connection between entrepreneurs and state remains strong. Sometimes the state helps individual entrepreneurs within a branding strategy. For example, the local office of Nanjing Pukou hi-tech zone advertises and promotes the "biological medicine valley" for located drug companies. At the same time, state-owned-enterprises (SOEs), such as the State Railway, begin to cooperate with private firms established by these returnee entrepreneurs.

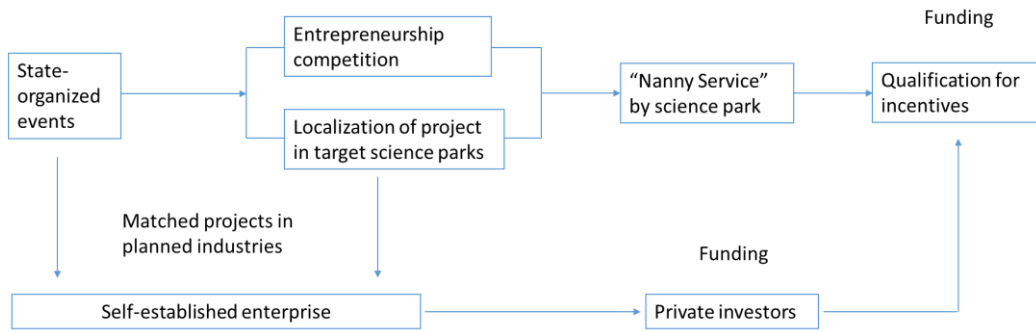


Figure 3, an alternative talent-attracting model in Nanjing

The gradually maturing venture capital in China, on the other hand, has created an alternative for high-skilled returnee entrepreneurs. Preferred by a few of the interviewees in Nanjing, this model suggests a bottom-up tendency. After gaining clear knowledge of the target industries with strategic emphasis in the development plan, three out of thirteen interviewees start their firms and projects on their own, without participation in the state-organized competition. Once they have their enterprise running maturely with already accessed private venture capital, they start to apply for incentives at this stage. These returnee entrepreneurs tend to cooperate with the local state as well as SOEs instead of merely seeking assistance and service from them. This seems like a “win-win” situation for both returnee entrepreneurs and local state (Nanjing Talent Center, 2017). Individual returnees can benefit from incentives and branding, meanwhile, the local state needs not to provide “nanny service” during the start-up phase, which saves plenty of human resources. However, this model still has a directive nature, because returnee entrepreneurs could not be qualified with incentives unless they are running the business within the top-down planned industries. This model is also not suggested for inexperienced returnees, who lack the ability to combine both western high-tech skills and local relationships (Sternberg, 2010).

4.2—Non-economic challenges for high-skilled Chinese returnee entrepreneurs

■ Challenges in working culture

In this field research, it is found that non-economic challenges for high-skilled Chinese returnee entrepreneurs in Nanjing are mainly brought by **cultural factors**. Typically, these cultural factors appear during routine work as a commonly concerned challenge:

“A major challenge is the working culture. I used to work from 10 to 18 from Monday to Friday in the U.S. The rest of the day belonged to myself. In China, I have less freedom to manage my own time. I always need to be accessible to others in the company. In the U.S. we sent emails to communicate only at the working time. Back here in Nanjing, you know, Wechat on the phone, calls at midnight...Real decision would be made over dinner, not in the daytime. You can hardly escape”

Despite different attitudes towards overtime working, all thirteen interviewees see such challenges in **working culture** merely as differences, saying “this is how business is done in China”. For entrepreneurs who **favor business benefit**, these challenges are “pre-calculated” and overcome in the re-adaptation process, which often takes a short period of time.

“Years ago, on every Friday night after work, all the company members went out to karaoke to sing and enjoy, for a whole night with our clients. I quickly accepted it as a regular thing because this definitely helped the business. Besides, most of them have become my best friends now, even we no longer have a formal commercial link. People connect closer here than in the U.S..”

Furthermore, in this Nanjing case study, most returnees believe that it is their **diversified value** that helps them to overcome cultural challenges, instead of the unchanged old value.

“It was more like facing differences rather than constraints when I came back to start a business. Most importantly, I have experienced multi-cultural environments, and I am easily adapted to changes. I can do things in American ways as well as in Chinese ways. This is the true advantage of being a returnee.”

“I would say I have definitely changed my value. But it’s neither same as my old Chinese values nor with the U.S. ones. China’s economy is sharing more similarities with the developed countries’, but there is no need to be the same, both in the business model and in personal values.”

■ Lack of respect for technological knowledge

Cultural challenges not only include overtime working but also involve the recognition of technology and knowledge, which is affected by the socio-cultural climate. One shared challenge for high-skilled returnees with technological expertise is that **the knowledge they have brought back is not respected**.

“When you deal with your clients or your partners, even with your friends, you easily become frustrated because you seldom talk about the technology itself. Everyone is so impatient. All they care about are short-term goals, making quick money as if they are on the doomsday.”

“A significant challenge is that technological knowledge is far more recognized in Western countries. In China, it’s totally not the same. It’s a cultural thing related to the social atmosphere. A moderate way to say is that it’s more comprehensive here. Knowledge should relate to the state’s political goals, which affects customers’ selection then changes our marketing.”

One of the interviewees says that the cultural difference in recognizing technology and knowledge between China and developed countries has harmed his “entrepreneurial spirit”. Mental adjustment is always required, while individual economic development is supposed to be ensured. However, lack of respect for technological knowledge, as a socio-cultural factor, is believed to become long-term economic consideration by the interviewees. In other words, **non-economic challenges intertwine with economic challenges**, because the returnee entrepreneurs believe that (social) culture also influences their business.

“Honestly it just took 1 year for me to make the technological transformation in my business, but it took me 2 years to have a mindset shift that most of my advanced knowledge could be useless.”

“As entrepreneurs, we follow the direction of the market, so there is always a room to change in our business strategies. However, what if the direction leads to the extremely over-emphasis on propaganda and monopoly, instead of (technology) knowledge itself? What if bad products drive out good ones? Culture affects business, they are intertwined.”

4.3—Economic challenges for high-skilled Chinese returnee entrepreneurs

■ Human capital challenges

Both human capital shortage and human capital mismatch have been found as economic challenges for high-skilled returnee entrepreneurs in Nanjing. Regarding **human capital shortage**, in addition to the weak absorptive capacity as a result of lack of prior related knowledge, four interviewees also criticize the talent-attracting model itself when they fail to utilize their new external expertise.

“Our graduates are not equipped with state-of-the-art knowledge. For my company which produces new advanced materials, those employed graduates can only do very basic works. It is me who always do those essential researches. I always get tired and I wonder why I came back. ”

“They recruit someone back, for instance, based on his patents and technological achievements. What the policymakers don’t understand is that nowadays researchers seldom carry projects as single persons. Only recruiting one people back without his teammates can hardly achieve any great scientific outcomes. There are diverse detailed aspects of a project that only a research team can be competent in.”

Human capital mismatch, at the same time, is argued to be intertwined with non-economic reasons, such as culture. For instance, this mismatch is related to how university students choose their career in China where technological knowledge is not well recognized. According to the interviewees, financial knowledge is preferred by students with the highest scores in Chinese *gaokao*, the entrance examination to Chinese universities. Faculties in basic research and technology become the forced second option for university students after they fail to reach the entering score for their first choice. As a result of human capital mismatch, high-skilled returnees hardly have their employees perfectly specialized in their entrepreneurship’s direction.

“Before university, Chinese students hardly had knowledge or interest in their future choice of professions. They paid full attention to grades, then followed other students with highest scores to enter financial faculties. As an employer who wants to employ students in biology, I often see on their CV that they were forced to change their majors from other faculties to biology because of a low grade. At the same time, a great number of elite biology students have changed their major to the Internet because basic research is not the society’s favorite. I have to hire people without great expertise in biology and train them. That’s a mismatch, that’s challenging for my business.”

The third type of human capital challenge is found in this research, which is the **human capital drain** at the city level. Though Nanjing comes third in terms of higher education in China (Education Department of Jiangsu Province, 2016), only 33 percent of students from top-tier universities remain in Nanjing after graduation (Nanjing Talent Center, 2017). Out-competed by top-tier cities like

Beijing and new emerging cities such as Hangzhou, Nanjing is losing its top graduates. It is believed by nine interviewees that the finest graduates are supposed to leave Nanjing, moving to cities with a well-established environment for knowledge works. This city-level brain drain, suggested by some returnee entrepreneurs, lowers the skill level of their employees.

“To be honest, the skill level and technological knowledge of graduates in Nanjing is not satisfactory. Local graduates with the top level of expertise have already migrated to Beijing or Shanghai. You have to pay a high salary for these employees in Nanjing when your peers in Beijing are paying the same salary for much better talents. I’m thinking of moving away next year.”

■ Transitional challenges

The maturing venture capital in China has covered the shortage in **funding source** for high-skilled returnee entrepreneurs in Nanjing. Their assumed reliance merely on public incentives is not found in this research. Instead of substitute for private investment, public incentives turn to play a more complementary part only during the beginning stage for entrepreneurs running knowledge-based companies.

“Yes, we also got the incentives, from the policies and programs you mentioned. But I don’t think you become an entrepreneur for the sponsorship by the state, which is absolutely not the core. And if you grow big, that account of money from the state does not really make a difference.”

“We are the top thousand talents from overseas, right? There might be funding difficulties for those young entrepreneurs who have just graduated. But honestly, the private investors are extremely “enthusiastic”. They like to invest in us also because we are “certificated” by the state. For us, there are indeed more opportunities in China now than abroad.”

The abundant funding source along with flourishing private investment, though, generates a new type of economic challenge. The **market source** has become a prevailing difficulty for individual high-skilled returnee entrepreneurs in Nanjing. In a transitioning economy where large companies easily monopolize the Chinese domestic market, all of the interviewees admit that they have to make adjustments in their business model.

“Actually there is no need to do explore foreign markets. The domestic market is more than enough. But the enthusiastic investors could also be quite blind, flocking to a hot product altogether... According to my own experiences, the worst way to start a business in China is to entirely believe in your cool technology and products. You can’t compete with big bosses. Huawei, Baidu, Tencent...they have the meat and leave you with the soup. Your little advantage in technology is easily outweighed. The transitioning market and ignorant consumers won’t buy your innocence.”

As the transition of the economy requires a transition in governance, the second type of transitional challenge, **the role of the state**, is found in Nanjing too. According to the interviewees, however, the controversial directive top-down planning, which selects specific technologies to develop, has been rarely criticized. Most interviewees have a positive attitude towards the policy-driven talent-attracting model, indicating this approach succeed in raising the number of new firms in Nanjing as

groundwork for future technology catch-up.

“I would say the state is doing fine since it is at still an early stage. Indeed the state is more involved than those in the liberal market, but that’s also a kind of service-oriented governance, right? You can say it’s a directive state because it is in charge of many things, but I would not be here without its assistance. Moreover, seeing new companies booming, the state starts to realize it can’t reach its hands into the market too much.”

The role of the state is criticized, nevertheless, for its **ineffective implementation of policies**. A sufficient level of knowledge to evaluate the capabilities of attracted talents is missed. This leads to weak spillover effect, informality, and even corruption. Besides, the state fails to fulfill its promised plan in talent-attracting policies to provide land and space for commercial production and housing.

“When something truly advanced is presented to officials, it could be easily declined because few people in the conference room are able to evaluate its value, neither academically nor commercially. For the state, it is like a blind gamble to throw money... And there are still problems. For example, the slots for incentives are limited. The state “deal with special things in special ways”. There is not a standardized evaluation process. It could be quite unconvincing why someone is chosen for incentives while others are not.”

“Early in 2011 or 2012, the state was too eager to reach the target number of recruited returnees. It gave out too much land and housing which was unplanned. Now, new companies can hardly have production space. Some of them have to share with others, some they have to go hundreds of kilometers away to find one. Also, there are no rooms in the talent apartment anymore.”

The third type of transitional challenge, **guanxi**, which means the relationship between private actors and Chinese public sectors, is also found for returnee entrepreneurs in this research. This research finds that **state-owned enterprise (SOEs)** become the primary concern when returnee entrepreneurs deal with **private-public relationships** in Nanjing. Notably, these challenges often occur when SOEs become returnee entrepreneurs’ client. These challenges also arise during the proposed branding strategy in talent-attracting policies.

“In the U.S., despite some owned privately, the data management in transportation companies is supposed to be similar. These companies follow the same regulation and software systems. In Nanjing, it is weird as things go an opposite way. If one SOE in this district buys your product, the same type of SOE in another district doesn’t want to share it. You have to make your product different for a new client because that’s how they feel their department is unique. Furthermore, there are always more backdoors or identity categories required by these SOEs. Every time you sell your products to them, it’s a DIY process again, which is super inefficient.”

“Big SOEs always claim that they help you brand your product such as from district-level to street-level. They imply that you can monopolize with their branding. In exchange for this, you rarely make a profit from big SOEs. But in fact, your street level clients are already approached by your competitors, because you have spent so much time negotiating with those district-level SOEs.”

5. Discussion and conclusion

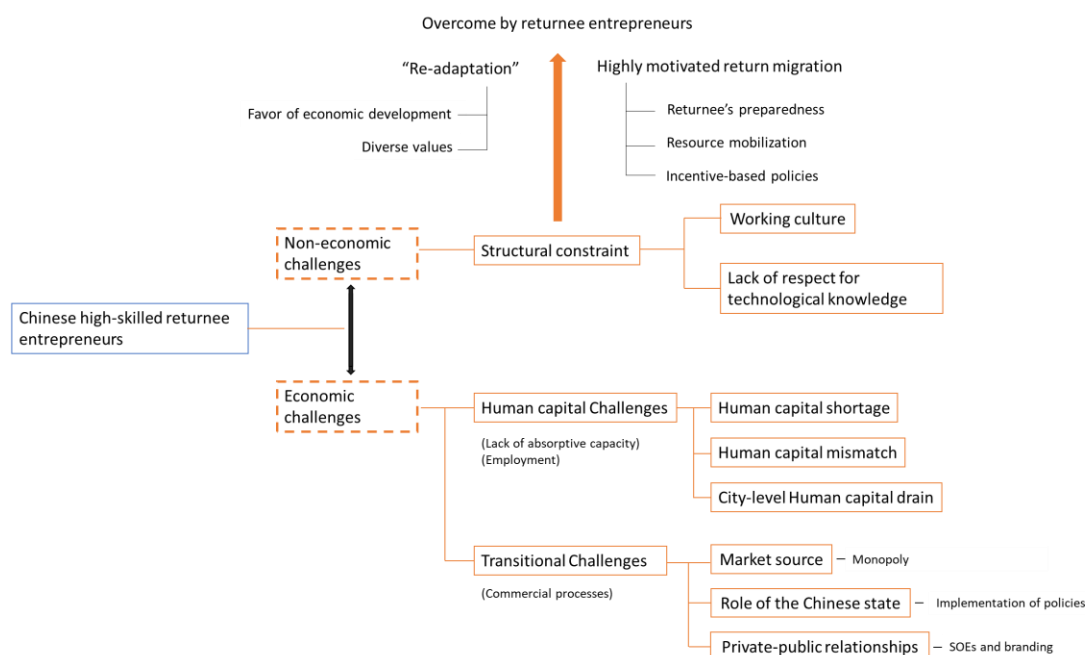


Figure 4, revised theoretical framework from the results of this research

5.1—Discussion

■ Evaluation of the policy-driven talent-attracting model in Nanjing

This research has introduced a popular model of using financial incentives to bring in high-skilled returnee entrepreneurs through policy intervention among Chinese cities. It is found in the fieldwork that most returnees hold a positive attitude towards this model. The directive human capital recruitment and top-down planning of supporting spatial component (Zhang, 2015) have built an environment prepared to absorb the technological expertise transferred by Chinese high-skilled returnees (Kenney, 2013). Different from Kenny’s (2013) argument that Chinese returnees would “only come back home after the sun rises” (p.391), high-skilled returnee entrepreneurs in Nanjing suggest that they are both beneficiaries from some local changes as well as the initiators of some other. They are not undergoing a repeated process of enterprise development of their foreign experiences. Instead, these returnee entrepreneurs are appreciating the “greener grass” (Wadhwa, 2011, p.1) in an early stage of technology transfer in China.

Though, restraints of this directive model of talent-attracting policies are demonstrated by the interviewees. Simply “lure” returnees via financial incentives cannot recruit the top elites to promote regional technology catch-up, in spite of the increased total number of attracted talents. Lack of prior knowledge, both academic and commercial (managerial), has reduced the efficiency of utilizing returnee’s technological expertise. In the meantime, some argued the Chinese local states are seeking “speculative urbanism” (Li, 2014; Huang, 2018) via planning massive projects and zones for high-skilled entrepreneurs. Land resources and local debts are forming an unsustainable approach of development when local officials’ career promotion is singly connected with the targeted number of recruited talents (Wu, 2017), which is a corresponding case in Nanjing.

■ Non-economic challenges for high-skilled Chinese returnee entrepreneurs

In Nanjing, non-economic challenges encountered by most high-skilled returnee entrepreneurs are caused by *social and cultural factors*. These people's favor of economic benefit motivates them to overcome such challenges without difficulty. For instance, the challenges in working culture are perceived as a structural difference rather than a constraint (Cassarino, 2000).

In this research, divergence from structuralism theory of return migration is found during their "return of innovation" (Lowell, 2001). For returnee entrepreneurs in Nanjing, they reveal that it is their diversified value, which they gained from multi-cultural experiences, that contributes to their re-adaptation process, rather than the unchanged value supposed in the theory. Remarkably, non-economic and economic challenges are believed to be intertwined. In other words, central economic considerations for these entrepreneurs could be generated from non-economic aspects. For instance, lack of respect for basic technological knowledge, university students' career selection, and employment challenges for high-skilled entrepreneurs are associated.

■ Economic challenges for high-skilled Chinese returnee entrepreneurs

According to the literature on technology catch-up as well as the results from this field research, two classes of economic challenges are elaborated during the enterprise development for high-skilled entrepreneurs in Nanjing. Besides business problems, *social, political, and geographical reasons* also hinder their growth.

Human capital challenges, the first category of economic challenges, have brought great constraint in terms of employment for high-skilled returnee entrepreneurs. Such human capital challenges are believed to originate in the Chinese higher education system (Lu, 2008). The shortage in human capital with unsatisfactory skill level lowers the economic performance of entrepreneurship. A mismatch occurs between returnees' professional field and local graduates' skills, too, as a result of the different recognition of technological knowledge and other knowledge by Chinese university students. Additionally, the human capital drain of Nanjing reduces the possibility for returnee entrepreneurs to engage elite employees with the top level of expertise.

On the other hand, transitional challenges bring troublesome circumstances for high-skilled returnee entrepreneurs during their commercial business processes, such as production or marketing. Instead of funding, the difficulties in finding market source have become a common dilemma in the Chinese domestic market. Monopoly is an unavoidable consideration for returnee entrepreneurs who run small-scale companies, which forces them to adjust their business strategies. Secondly, despite the less criticized directive nature, the local state is blamed for lacking the knowledge, experiences, and a clear evaluation standard when taking incentive-driven policies. Its implementation of policies brings economic challenges when the state fails to provide the promised production space or housing. Thirdly, challenges often occur within the private-public relationship for high-skilled returnee entrepreneurs. Either simply selling their products or seeking clients for branding has become an annoying process as long as local SOEs are involved.

5.2—Main Conclusions

This research, which targets high-skilled returnee entrepreneurs, have enriched our understanding

of the Chinese technology catch-up model which applies incentive-based human capital attracting policies. It is found in Nanjing that recruited returnee entrepreneurs frequently face non-economic challenges as well as economic challenges because the institutional governance of science and technology in Nanjing is still immature. Their non-economic challenges intertwine with economic challenges, as a result of multiple influences from social, cultural, political, and geographical aspects.

5.3—*Reflection*

This research has its *limitations*. The first drawback is about its sample selection. As snowball and gatekeeper strategies are used to recruit the target returnees, interviewees tend to share similar life stories, enjoyed incentives, and even personal values. These similarities could lead to the loss of variety in diverse opinions. Also, it remains doubtful whether a case study in Nanjing may represent a variety of Chinese cities considering their policy initiatives are argued to be specific under their own local contexts.

The second limitation is about the subjectivity and positionality (Hennink, 2010) when applying qualitative methods. As an overseas student, my identity also has an influence on those interviewees. Rather than sharing personal opinions, some high-skilled returnees may see the interview as an approach to provide suggestions for a future returnee talent, thus may lose objectivity. Moreover, shared identity as people both with overseas experience may hinder the discovery of knowledge which is taken for granted by the interviewer and interviewees, but not by non-returnees.

This research provides *policy implications* for Nanjing and other Chinese emerging cities (Wu, 2016) which are adopting a popular policy-driven talent-attracting approach. First, university education should be the long-time emphasis for regional comparative advantage. Both a sufficient level in a certain type of knowledge and the diversity of background in professions should be generated when students graduate to become local labors. Second, policymakers from the local states should be aware of the characteristics during stages of a technology development. Service provided by their planned science parks or high-tech zones should be upgraded because “the economic factors that give rise to the start of a cluster can be very different from those that keep it going.” (Bresnahan, 2001, p.835). The local state should consider when to make a governance transition from the target-oriented model (Zhang, 2011) which increases the number of attracted talents, to encouraging the growth of technology which is driven by other determinants (Wallsten, 2001). This requires some bottom-up practices which are challenging for the Chinese bureaucracy. Third, more geographically-efficient measures and programs, for instance, clustering similar firms within an industry to share production space, the cooperation with universities’ laboratories, and a mature outsourcing chain should be included in future talent-attracting policies. Last but not least, non-returnee entrepreneurs should be able to benefit from the agglomeration of technology development and the spillover effect. Forum, conferences, and seminars should be organized to exchange ideas from diverse stakeholders, who require a clear evaluating standard and effective policy implementation.

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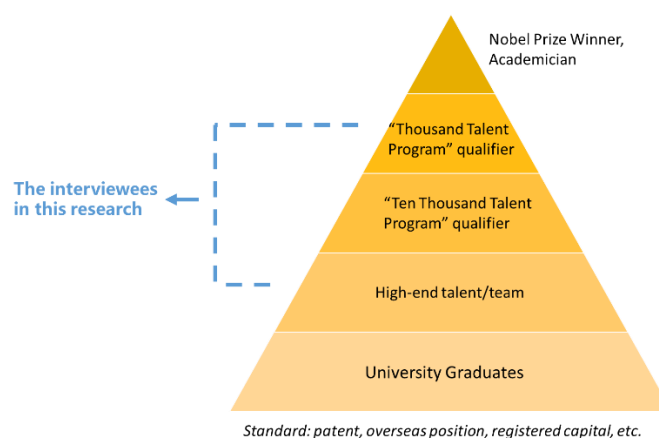
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Appendix I: Talent-attracting policies in Nanjing

In 2009, the promulgation of a policy titled “*the Thousand Talents Plan*” (“*国家千人计划*”) marked a transition the technology catch-up strategy of China. This national policy followed by provincial and city level policies (e.g. “*High-level Overseas Talents Strategy*” in Jiangsu Province and “*321 Talent Program*” in Nanjing City) attempts to attract overseas returnees in high-technology sectors via boosting investment in science and technology. Simultaneously, the “*Medium and Long-Term Science and Technology Development Plan*”, governmental commercialization initiatives, as well as the development of high-technology and science parks contributes to bringing in the target people, who are described as “overseas high-skilled talents” (“*海外高端人才*”) or “high-skilled innovation talents and entrepreneurial talents” (“*创新创业人才*”).



Graph 2, pyramidal classifications of talents in Nanjing. Source: Nanjing Talent Center, 2017

Application requirements

Applicants should return to Nanjing as their first and the only time to enjoy similar incentives from Chinese cities. They should guarantee at least a three year period of full-time working after their localization.

Financial incentives

- One-time incentives: ¥ 40,000 (city-level) to ¥ 2,000,000 (national-level) per project.
- Long-term incentives: salary subsidies; ¥ 3,000,000 to ¥ 8,000,000 for the enterprise within three years; free rent in science park incubators; low-interest loans.

Other grants

Travel allowance; housing allowance; living space in talent apartments; “convenience” in the service regarding visa, insurance, family settlement, and conversion of driving license.

Date of application

Every June (national-level); June to July (provincial-level); and September (city-level)

*€1 ≈¥7.7

Appendix II

Interview Guide with High-skilled Returnee Entrepreneurs

Introduction

This research is being conducted to get knowledge about the challenges for high-skilled Chinese returnee entrepreneurs. I am conducting this research for my master thesis at Utrecht University. The purpose is to get typical or various opinions from the perspective of the returnees themselves.

I promise that this interview is conducted under my interviewee's full consent. All the related documents, including the recording, transcriptions and other writing materials will be only accessible by the research team with academic use.

Opening questions

1. Could you please briefly share your story of study and working experience abroad?
(Length of time /degree/major/possible international networks)

2. For what reason did you come back?
(Family/social ties/career promotion/government incentive and policy/domestic market/infrastructures)

3. By which means did you come back?
(Incentive policy and program/platform and community for returnees/alumni network)

Key questions

4. What are the main challenges have you faced, after you had started your business back in China?
--Could you specify with your own stories to better elaborate

5. To make your knowledge applicable for business use in China, what economic challenges have you faced during the localization process?
(Human capita challenges/role of the state /market challenges)

6. During your return migration, have you faced some non-economic challenges?
(Structural constraint/ Re-adaptation process/Perception of non-economic challenges)

7. How do you value the promotion of policies and programs that try to attract returnee talents, which is very popular among Chinese cities?
(State-sponsored model/venture capital/transition of the way of governance)

Closing questions

Are there any other challenges that you think is special in your story, as a recent high-skilled Chinese returnee entrepreneur?

What suggestions will you give to new Chinses returnees?

Appendix III

Interview Guide with Local Officials

Introduction

This research is being conducted to get knowledge about the challenges for recent Chinese returnee entrepreneurs. I am conducting this research for my master thesis at Utrecht University. I am especially interested in different challenges for recent Chinese returnees, their relationship with the local state, and the effectiveness of incentive policies.

I promise that this interview is conducted under my interviewee's full consent. All the related documents, including the recording, transcriptions and other writing materials will be only accessible by the research team with academic use.

Opening questions

1. Could you please briefly introduce your work as an official who is responsible for certain parts of these returnee entrepreneurs' business?

(Introduction of talents/ promotion of programs/ implementation of policy)

Key questions

2. What are the main challenges have you faced during the process of attracting returnee entrepreneurs?

(Implementation of policy/the type of attracted projects)

3. What challenges have you seen the returnee talents faced when they try to utilize their advanced knowledge and technology that they brought back?

(Absorptive capacity/difference in the market/localization)

4. From the state's standpoint, what part is difficult when you try to provide assistance to returnee entrepreneurs?

(Labor/market/facilities/financial assistance/social and cultural differences)

5. How do you assess the implementation of incentive policy and promotion programs in Nanjing?

(Bureaucratic goals/ failure of implementation/transition of top-down governance)

Closing questions

6. What suggestions do you have for new Chinese returnees, especially those attracted by incentive policies?

Appendix IV In-depth interviews and focus group discussions

- *In-depth interviews*

With officials from the Nanjing local state:

<i>Date</i>	<i>Location</i>	<i>Length</i>	<i>Interviewee's position</i>
2017-09-20	Nanjing Talent Centre	30 minutes	Director of personnel center of Nanjing
2017-09-20	Nanjing Talent Centre	30 minutes	Head of the personnel section of Nanjing
2017-09-24	Conference room of Hi-tech Industrial Zone	60 minutes	Head of personnel section of Jiangbei Hi-tech Industrial Zone
2017-11-27	Nanjing Talent Centre	30 minutes	Organizer of the 2017 Nanjing overseas returnee forum

With returnee entrepreneurs (anonymity are required by all of the interviewees):

<i>Date</i>	<i>Length</i>	<i>Interviewee's enterprise in</i>	<i>Position at the interview time</i>
2017-10-17	70 minutes	Security surveillance, Handheld computer, Robots, VR, AR	Managerial position of a VR enterprise founded in Nanjing in 2016
2017-10-26	120 minutes	Medical information system; Sharing bicycle	Managerial position, patent holder and co-investor of OFO, Mobike and Yong'an sharing bicycle companies
2017-11-08	60 minutes	Wearable devices, VR, AR, Non-human supermarket	Managerial position of ZTE Corporation;
2017-11-15	40 minutes	Transportation planning and design	Managerial position of a transportation planning company
2017-11-19	30 minutes	Sports science	Founder and CEO of mobiYY, a badminton-focused sports science company

2017-12-15	30 minutes	Online education	Presenter in the 2017 Nanjing overseas returnee forum
2017-12-15	30 minutes	Environment and new materials	Presenter in the 2017 Nanjing overseas returnee forum
2017-12-15	30 minutes	Smart cars and transportation	Presenter in the 2017 Nanjing overseas returnee forum
2017-12-24	60 minutes	Fashion, Clothe designing	Co-founder of a fashion company located in a rural area

*All of these interviews have been conducted at the interviewee's working place or a bar near these places

*VR= Virtual Reality, AR=Augmented Reality

● *Focus group discussion*

With returnee entrepreneurs:

<i>Date</i>	<i>Location</i>	<i>Length</i>	<i>Position at the interview time</i>
2017-11-03	Conference room of Hi-tech Industrial Zone	60 minutes	Managerial position of a Safety Education corporation
			Founder of a newly started business in technological clothing material
			Founder of a growing business in rescue robots
			CEO of an international biological reagent company