

What Makes a Place Attractive to Chinese *Haigui* :  
Behavioral Analysis of the Locational Choices of Highly Educated  
Chinese Returnees

September 2012

Graduate School of Social System Studies

The University of Kitakyushu

PhD. Dissertation

Xue PENG

© 2012 by Xue PENG

All rights reserved

**What Makes a Place Attractive to Chinese *Haigui*: Behavioral Analysis of the Locational Choices of Highly Educated Chinese Returnees——**

**By Xue PENG**

**Abstract**

It is now commonly recognized that creativity is an important driving force in regional economic development. China has lagged behind the “creative economy” prevailing in Western countries, which utilizes people’s creativity. China’s current growth model has relied largely on intensive input of cheap labor and capital, high consumption of energy and natural resources, and caused damage to the natural environment. This growth model has gradually reached a limit and is now believed to be unsustainable. China is in urgent need of an adjustment to the old growth model, which would include a creative strategy to develop industries with higher added value and updated industrial structure. A technology-centered creative strategy would be the right choice for a country such as China, which has a huge supply of labor. For a country on the technological periphery of the world system, an efficient way to catch up has been learning from core nations.

China has experienced a large outflow of talented people, who mainly migrate to developed countries for higher education and currently has become one of the largest source country of highly skilled migrants in the world. Once overseas, these talents obtain new knowledge, technologies, and business know-how in developed countries. This huge stock of talented migrants is a resource that China can utilize. Returnee talents, usually called *haigui* in Chinese have been playing significant roles in China’s mission to be creative. Among others, *haigui* entrepreneurs are now making vital contributions to create job opportunities and transfer technologies into economic growth.

This thesis focuses on talented migrants with study or work backgrounds overseas, and it studies their choice of country and the choice of location inside a country (China). The methods of analysis adopted in this thesis are mainly discrete choice

models, which deal with micro data collected from individual samples. The choice of location on the country level concerns the intention to return of overseas Chinese. A survey is conducted the alumni members of Peking University in Japan and respondents are observed for their choice between two options—either to return to China or not to return. In this case, a binary logit model is used. However, the analysis of behavior in choosing a province presents more than two alternatives. The observed samples were required to choose one province among all the whole China. Optional choices are categorized and grouped in appropriate ways in order to simulate the actual choosing situation. Thus, in the analysis of behavior in choosing a province by both general *haigui* and *haigui* entrepreneurs, the nested logit model is adopted.

The results of choices of country show that the intentions to return of overseas Chinese are negatively related to their age, current income, integration in the host society, and the preference for permanent residence in the host country. Whether to return is a decision a talented migrant tends to make in younger life stages when the income is relatively low and integration to the host society is still weak. If someone stays and builds their career abroad, the intention to return will become weaker as he or she grows old. Interestingly, the expected income gap between host and home country is not significantly related to one's return intention. Income level in China has increased largely due to the country's remarkable economic growth, and the income gap compared with developed countries has been narrowed. As a result, the income expectancy in China is now acceptable for overseas Chinese. Thus, in this era, differences in income are not a decisive factor in the intention to return. The advantages of China for overseas Chinese are the social ties in the home country. The necessity of being close to one's spouse (including a potential future spouse) has made many talented migrants want to return to China. Moreover, the emotional attachments to their relatives and friends in China are compelling for overseas Chinese, thus strengthening their intention to return. This result is consistent with the finding that integration into the host society decreases the intention to return. Becoming accustomed to the social atmosphere is also very important for Chinese

talents. In contrast to the significant positive effect of social connections to return intention, no significant results with amenities were found. Similarly, institutional factors, such as China's one-child policy and democratic conditions, are found not significantly related. It should be noted that the significance results of the variables are not the same with the direct answer of the respondents. The decision process is too complicated for a decision maker to evaluate every factor objectively and accurately. Through discrete choice approach which focused on the final choice, the biases from stated preference were diminished and the fundamental influential factors were revealed.

It is worth noting that overseas talents with long experience abroad and in better-paid positions are usually those with a low intention to return. Meanwhile, the profile of successful *haigui* entrepreneurs is very similar to those who are reluctant to return. To attract the most creative migrants is a difficult task for the country, as well as for local governments. When they actually get back to China, how do they choose a location in which to settle? General *haigui* and *haigui* entrepreneurs show a similarly uneven distribution pattern. Provinces differ largely in the stock of general *haigui* and *haigui* entrepreneurs. Developed coastal cities, especially metropolises such as Beijing and Shanghai, have attracted most of the general *haigui* and *haigui* entrepreneurs, and the inland provinces are left with very few.

Economic reasons are the main cause of the uneven distribution of *haigui*. Furthermore, economically developed areas are usually accompanied by the features of a creative milieu, such as high talent power, high technology power, and high tolerance.

The locational choice of *haigui* entrepreneurs are found to be affected by high technology power, a dynamic economy, and a big market. Interestingly, among three indicators of technology power, what *haigui* entrepreneurs are attracted to completely differ from that of general *haigui*. *Haigui* Entrepreneurs are affected by R&D investment or the high-tech industry structure, while general *haigui* are more related to the technology outputs (i.e. patents). These findings suggested *haigui* entrepreneurs brought back technologies or ideas of their own when they returned.

What they need is only the support to continue R&D research and to transfer it into marketable products, instead of ready-made technology outputs. Also, social connections matter to *haigui* entrepreneurs, and different types of connections are ranked in the following order: birthplace > work place > study place. Comparison among the three highly developed coastal provinces showed that social connections are most valuable in the capital of China, Beijing, while Shanghai comes next, and Guangdong the third.

By utilizing both personal and locational attributes in the model, this research empirically proves for the first time the relationships between people and place in China. The major academic contribution of this thesis is to test creative class theory about “tolerance” in China. While the distribution of general *haigui* appears to be related to a tolerant milieu, *haigui* entrepreneurs behave in a way not affected by it. The conclusion would be that the location choice behaviors of employers in the creative class are different from those of other creative members. It is necessary to distinguish the members playing different roles in economic activities to make effective creative strategies.

Other major policy implications of the thesis are about how to attract talents and hence to reduce the regional differences. For the country, laying focus on younger talents who have not settled in host country yet will make policies more efficient. And, utilizing social networks through associations of alumni or fellow-townsmen is a good way to appealing to overseas Chinese talents. On the provincial level, it is not easy to alleviate the huge differences. By increasing R&D investments, enhancing the quality of higher education and encouraging students to study abroad, it is possible to attract more *haigui* entrepreneurs. At the same time, the governments of inland provinces need to overcome the worship of high degrees and be more open-minded to screen potential business plan based on profitability.

## どんな地域が中国人「海帰」人材を呼び寄せるのか

### ——中国人専門人材の帰国地選択行動の分析——

#### 学位請求論文要旨

彭 雪

経済学では、地域発展の原動力は人の「創造性」にあると認識されるようになってきた。「創造」をキーワードとする「創造経済」という発展モデルが欧米で主流となっている中、中国はいまだに、安価な労働力と資本の大量投入及びエネルギー・天然資源の過度消費、自然環境へのダメージを特徴とする旧式の成長モデルに依存している。しかし、この成長モデルは徐々にその限界に達しており、持続可能ではないと考えられている。中国にとって、従来の成長モデルを調整し、高付加価値化及び産業構造を高度化する「創造」的な発展戦略を立ち上げることは急務である。「文化中心」と「技術中心」という二種類の創造戦略の中、中国のように膨大な数の労働者を有する国にとっては、現段階において、「技術中心」が正しい選択であろう。しかし、技術における世界システムから見ると、中国は周辺国であって、中心にある先進国に比べ、かなりの差がある。キャッチアップする一番効率的な方法は、イスラエル・台湾・インドなどの地域と国の経験から分かるように先進国に学ぶということである。

中国は大規模な高等人材が海外に流出する（いわゆる「頭脳流出」）現象を経験している。現在は世界最大の専門人材流出国の一つとなっている。海外

在住中に、これらの中国人材は受入国である先進国で新しい知識や技術、ビジネスノウハウを取得している。今まで流出した膨大な数の海外中国人材は、母国中国にとって、非常に利用価値の高い人材資源になっている。帰国した人材（「海帰」と呼ぶ）は中国の各領域で活躍し、「創造」的な中国を作り上げる重要な役割を果たしている。特に「海帰」起業者は、技術や知識を経済的な利益に転換できる人材として、経済発展に大きく貢献している。

本稿は、海外の留学・研究または就職の背景を持つ人材に焦点を当て、彼らの国と国内の帰国地に対する二つの空間レベルにおける選択行動を研究した。本稿で採用した分析方法は、個々のサンプルから収集したマイクロデータを扱う離散選択モデル (discrete choice model) である。国レベルでの選択は、中国に帰るかどうかの意図に関するものである。アンケート調査を行い「中国に帰る」と「帰らない」の二つの選択肢から彼らの決定を観察した。具体的な離散選択モデルは、二項ロジット・モデル (binary logit model) を使用している。しかし、中国国内の帰国地を選択する行動は二つ以上の選択肢から一つを選ぶものである。観測されたサンプルは、中国大陸のすべての省市から一つを選んでいると仮定した。可能な選択肢は、実際の選択状況をシミュレートするために、適切な分類方法でグループ化している。したがって、一般「海帰」及び「海帰」起業者の帰国地の選択行動の分析は入れ子型ロジット・モデル (nested logit model) を採用した。

国レベルの選択行動結果が示したのは、中国海外人材の帰国意向が年齢、現在の収入、ホスト社会との統合、およびホスト国の永住権への態度などの要素と負の相関関係をもっているということだ。所得が比較的低く、ホスト



社会との統合もまだ弱い若い世代に帰国意向が高い傾向が表れた。海外に残ってキャリアを構築していく場合は、その移住者の帰国意向は徐々に弱くなる。面白い点は、ホスト国と母国間での所得格差は帰国意向と関係していないという点だ。これは、中国の所得水準が著しい経済成長とともに大幅に上昇しており、先進国との差が縮小され、その差が中国海外人材にとって受け入れられる程度となったためである。従って、中国にとって、所得水準は海外人材の帰国意向の決定的な要因ではない時代に辿り着いたといえる。中国海外人材を誘致するための中国最大の利点は、社会的な繋がりである。配偶者（潜在的な将来の配偶者を含む）の存在は中国海外人材の帰国意向に強く影響している。また、母国の親戚や友人への感情的な依存性も彼らを帰国させている。この結果は、ホスト社会との統合が帰国意向を低くさせていることと一致している。社会関係は中国海外人材にとって大切なことである。社会関係が帰国意向に正の影響を与えているのに対して、アメニティははっきりとした影響を示していない。また、一人っ子政策、民主状況等のような国の制度的要因も帰国意向に大きな影響を与えていない。しかし、以上の結果は、サーベ－対象者に直接聞き出した意見とは一致していない。人の選択決定はあまりにも複雑なので、直接各要因を客観的に評価するのは難しい。そのため、離散選択分析を通じて、決定プロセスをシミュレートし、その結果から各要因の影響を分析した。こうして個人評価する際の誤差を減少させることにより、更に客観的に具体的な本質影響の要因を見つけることができた。

ここで注目すべきなのは、分析結果によると、海外滞在の経験が長く、高収入の職に務めている海外人材は一般的に帰国意向が低いということだ。し

かし、中国で最も成功した「海帰」起業者のプロファイルはちょうど帰国意向の低い人と類似している。成功のポテンシャルの高い海外人材を誘致することは、国にとっても、各省市にとっても難しい課題である。彼らは実際に中国でどのように帰国地を選んでいるのか？一般「海帰」も、「海帰」起業者も、非常に集中した分布パターンを示している。その数も各省市によって大きく異なっている。北京・上海をはじめとする経済の発達した沿海部の省市が帰国した海外人材の大部分を集めていることに対して、広域な内陸部に帰国する人材は非常に少なくなっている。

一般「海帰」の分析を見ると、地域所得水準が彼らの分布パターンに影響している主な要因である。さらに、所得水準が高い地域には常に、高い人材力 (talent power) ・技術力 (technology power) ・寛容性 (tolerance) という「創造」的な環境の特徴を同時にもっている。寛容性のある「創造」的な環境は一般「海帰」の集まりと関連性がある。

「海帰」起業者の帰国地選択は、高い技術力、ダイナミックな経済、大きな市場に影響されることが分かった。興味深いことは、「海帰」起業者に影響している技術力は、一般「海帰」に影響しているそれとは異なるということである。一般「海帰」が既成の技術力に影響されるのに対し、「海帰」起業者は R&D 投資やハイテク産業構造に魅了されている。これは、「海帰」起業者が独自の技術やアイデアを持って帰国することからの影響を反映している。彼らが必要とするものは R&D 研究への支持や、技術を市場に転換するサポートである。そして、社会的な繋がりも「海帰」起業者の選択行動に大きく影響している。各種類の社会関係が「海帰」起業者へ与える影響力は、出身地

＞前の職場＞大学（院）所在地という順位が付けられる。中国沿海部で三つの高所得省市を見てみると、北京の場合は、社会関係が最も重視されている。上海における社会関係の重要性はそれほど高くなく、広東省においては最も低くなっていると見られる。

本研究は個人レベルのデータと場所属性両方を利用し、初めて中国における人と場所の関係に関して実証研究を行った。本論文の主な学術貢献は、中国を対象国として、「寛容性」を中心とする「創造階級」理論を検証できたことである。一般「海帰」の分布は寛容的な環境に集中するのに対し、「海帰」起業家の選択行動は環境の「寛容性」に引きつくことはない。結論としては、「創造階級」において、雇用者は被雇用者と異なり、環境の寛容性に対してそれほど求めていない。今後、地域が効率的な「創造」戦略を構築するには、経済活動における役割の違う人材を区別する必要がある。

本研究の他の主な政策インプリケーションは、人材の誘致策及び地域人材格差を縮小する方法である。国レベルの誘致策としては、海外でまだ定着していない若い世代に重点を置くことがより効率的だと考えられる。そして、学友会・同郷会などの社会的なネットワークを通じて人材誘致を行うのはいい方法である。国内の省市レベルでは、今までの人材集中の格差を縮小するのは非常に難しい課題である。しかし、R&D投資や高等教育の強化、大学生の海外留学奨励等の取組みによって一定の効果が表れると考える。もう一点、本研究において内陸の地方政府が海外研究経験や学歴を重視しすぎる傾向が証明されたので、今後の人材誘致戦略として、学歴や学術能力以外の能力を更に重要視していくべきと考える。

## **Acknowledgements**

First of all, I would like to thank my parents who gave me my life and have always supported my decisions. They raised me in a way of letting me make my own decision and seldom intervened. Thus, I acquired the courage to chase my dream.

I am grateful to my principal supervisor, Professor Hidehiko Tanimura, who has given valuable advice on my thesis. His strong sense of the latest trends in the international academic world has always made his comments enlightening. He also provided me with the opportunity to do research work at The Centre for the Study of East Asian Development (ICSEAD), which helped me extend my outlook and know more about the academic world. He also kindly provided me with financial support. Without him, it would have been academically as well as financially much harder for me to finish my studies in Japan.

I am also especially grateful to my vice supervisor, Professor Erbiao Dai, who patiently followed all my arguments (right or wrong) and supplied me with new ones. He always told me that “Life is like long-distance running. The winner is usually the one who sticks to the end, not necessarily the fast.” His insistence and passion for his research work have encouraged me a lot. His wisdom as well as noble personality have influenced me in so many ways and make me want to become a researcher like him

I would also like to thank Professor Yanwei Chai in my college at Peking University. I started to get interested in academic research under his influence and got advices even after the graduation. It is also him who introduced me to the opportunity to study in Japan. I am very lucky to have being helped by many people. Among them, the above three professors are the most important ones who lead me to the way of becoming a researcher. My dream would never have come true without their support.

During the writing of the thesis, the researchers at ICSEAD have provided me with many valuable comments at seminars. I was also enlightened by the opinions of commentators at

several academic conferences, such as the International Society for the Study of Chinese Overseas (ISSCO), Japanese Research Association for Chinese Economy, The Society for Chinese Management Studies, and Applied Regional Science Conference. The Peking University Alumni Association (PKUAA) in Japan provided me with much support during the investigation, especially GU Nan, DAI Hancheng, and MA Liangpeng. I am grateful to everyone who helped me to complete this thesis.

Finally, I want to thank my fiancé who has always encouraged me and never complained about our long-distance relationship.



# Table of Contents

## What Makes a Place Attractive to Chinese *Haigui* : Behavioral Analysis of the Locational Choices of Chinese *Haigui*

### 中国人材の帰国地選択行動の分析 ——帰国人材を対象として——

Chapter I. Introduction .....	1
Chapter II. Literature Review and Background.....	11
1. The role of talents in economic growth .....	11
2. Towards a creative China: what kind of talents does China need most? .....	14
3. Factors affecting the locational choices of returnee talents .....	26
4. Methodology – Discrete choice analysis .....	35
Chapter III. Analysis of the Locational choice of Overseas Chinese Talents .....	59
1. Introduction .....	59
2. The recent trends in Chinese talents going abroad and returning .....	60
3. Variables and data .....	72
4. Results and discussion .....	83
5. Concluding remarks.....	94
Chapter IV. The Distribution Pattern of General <i>Haigui</i> and Underlying Factors.....	109
1. Introduction .....	109
2. Distribution of <i>haigui</i> .....	111
3. Variables and data .....	118
4. Results and discussion .....	123
5. Concluding remarks.....	135
Chapter V. Analysis of the Locational Choices of <i>haigui</i> Entrepreneurs.....	140
1. Introduction .....	140
2. Distribution of <i>haigui</i> entrepreneurs.....	149
3. Variables and data .....	153
4. Results and discussion .....	168
5. Concluding remarks.....	188
Chapter VI. Summary and Future Research .....	200
1. Summary.....	200

2.	Future research .....	204
	Abbreviations .....	207



## List of Tables

Table 1. The industrial coverage of various creative concepts by different researchers or institutes .....	16
Table 2. Numbers of students studying abroad and returned.....	70
Table 3. Accumulated number of Chinese students going abroad and returned .....	71
Table 4. Choices of return intention .....	80
Table 5. Variable List.....	81
Table 6. Summary Statistics .....	82
Table 7. Result of top three push/pull factors and final scores .....	85
Table 8. Logit regression results.....	90
Table 9. The distribution of international students from China, by country of origin .....	102
Table 10-1. The results of collinearity diagnosis (1) .....	103
Table 10-2. The results of collinearity diagnosis (2) .....	103
Table 11-1. Questions and summary results of the questionnaire.....	105
Table 11-2. Questions and summary results of the questionnaire (continue) .....	105
Table 12. Question: Please compare China and Japan on the following factors.....	107
Table 13. Question: Please list the top 3 important factors that pushing you out of your home country (push effect) and that pull you back to the home country (pull effect).....	107
Table 14. The distribution of generate <i>haigui</i> in provinces (2008).....	114
Table 15. Alternative variable list.....	122
Table 16. Ages of the samples .....	123
Table 17. Summary of statistics.....	125
Table 18. Collinearity Diagnosis .....	126
Table 19. Results of nested logit regression (with social connection variable) .....	128
Table 20. Results of nested logit regression (without social connection variable) .....	129
Table 21. Summary statistics of linear regression .....	133
Table 22. Collinearity diagnosis .....	134
Table 23. Results of linear regression.....	135
Table 24. Distribution pattern of generate <i>haigui</i> and <i>haigui</i> entrepreneurs in China .....	151
Table 25. Descriptions and sources of place variables .....	157
Table 26. Description of personal variables .....	158
Table 27. Statistical summaries .....	159
Table 28. Ages of the samples .....	160
Table 29. Length of time abroad.....	160
Table 31. The respondents in multiple host countries.....	162
Table 32. The results of Hausman-McFadden test in conditional logit model .....	163
Table 33. Comparison of Beijing, Guangdong and Shanghai.....	178
Table 34. The utilization of social connections with Beijing, Shanghai, and Guangdong.....	179
Table 35. The share of <i>haigui</i> entrepreneurs with social connections .....	180

Table 36. Comparison between inland provinces and Shanghai.....	183
Table 37-1. Collinearity diagnosis (1) .....	185
Table 37-2. Collinearity diagnosis (2) .....	185
Table 38. Regression results .....	187
Table 39. Information source or estimation method of <i>haigui</i> in 2008 (by province) .....	195
Table 40. Information source or estimation method of <i>haigui</i> entrepreneurs in 2008 (by province) .....	197

## List of Figures

Figure 1. Star scientists in a spiky world.....	3
Figure 2. Return rate from 1978 to 2010 .....	69
Figure 3. The respondents' perceptions of comparative aspects of China and Japan .....	84
Figure 4. Ranking of generate haigui's favorite cities as return destination.....	112
Figure 5. Distribution of generate haigui in provinces (2008) .....	116
Figure 6. Graphical representation of the concentration coefficient.....	118
Figure 7. The nested logit tree .....	127
Figure 8. The number of haigui start-up parks set up in various years.....	148
Figure 9. The number of haigui start-up parks (until 2009)) and items of preferential policies (2010) .....	148
Figure 10. Distribution of haigui entrepreneurs in China .....	150
Figure 11. Specification (1) of haigui entrepreneurs' decision tree .....	165
Figure 12. Specification(2) of haigui entrepreneurs' decision tree.....	165
Figure 13. Specification(3) of haigui entrepreneurs' decision tree.....	166
Figure 14. Specification(4) of haigui entrepreneurs' decision tree.....	167



## **Chapter I: Introduction**

The significance of human capital has been widely recognized in the economic development early in the 20th century (Schultz,1963; Becker, 1964), and the effects of human capital accumulations has been commonly introduced into the economic development models by many researches such as Arrow (1962), Uzawa (1965), Romer (1986) and Lucas (1988). In the 21st century, the importance of talented people has been further emphasized as the essential driving force of regional economic development. The latest research has put emphasis on people engaging in creative works. A series of researches on creative themes have enlightened us about understanding the distribution and locational choices of talented people nowadays. When the keyword, “creative” began to prevail globally, many countries rushed into the boom of drawing up creative strategies. However, it is important to recognize that countries in different phases of development should design creative strategies according to their own situations. Two types of creative strategies are currently apparent: US-style and European style. These two strategies have a common emphasis on the role of creative people and harnessing and harvesting talent, but differ in the industries on which they focus. Based on the different industrial structures and development trends, the US and Europe have chosen technology-centered and culture-centered strategies, respectively.

In contemporary China, although the European-style culture-centered strategy is supposed to be useful, the US’s technology-centered way is more suitable. In a vastly populated country like China, manufacturing is important for the ability to absorb a large labor force. However, China’s manufacturing sector has long been dominated by low-end processing and manufacturing, which relies largely on

intensive cheap labor, high-energy consumption, natural resource exploitation, and damage to the natural environment. This old growth model has gradually reached its limit and is faced with the sustainability problem. As argued by Young (1995) and Krugman (1994), China's growth, driven by input accumulation may soon hit the limits of diminishing returns and prove not sustainable. A deceleration is found in the productivity after 1990s by Islam and Dai (2009). According to them, the fast economic growth since the 1990s (in the period from 1991 to 2002) has mainly been achieved through extraordinary high rates of investment. These high rates of investment are already causing macroeconomic imbalances, and thus high GDP growth rate along with deceleration of productivity may not be sustainable if the situation keeps going on. To complete the process of industrialization and successful transformation of the entire economy, China needs to continue the high growth momentum and thus needs to continue to have the productivity growth (Islam and Dai, 2009). For that, China is in urgent need of adjusting to a creative strategy, updating the industrial structure, and developing industries with higher added value. For a country on the technological periphery area of the world system, China has lagged behind core nations with more advanced in technology. Learning from these core areas has proved an efficient way to catch up for developing economies, according to the experiences of South Korea and Taiwan.

Returnees (called "*haigui*" in Chinese, i.e., 海归) back from developed countries usually have acquired advanced knowledge and leading-edge technology, business know-how as well as international networks. Previous *haigui* have made great contributions to the development of China's higher education industries, research institutes and multinational firms. Now it is time to tap the creativities of *haigui* in developing high-tech industries.

Talent is never evenly distributed, especially the most creative people. Some places attract a great many talented people, while other places appeal to very few. A world map of talent (in any measurement) would show its distribution in peaks and

valleys. For example, the distribution of star scientists makes the world look very spiky (Figure 1). At the global level, developed countries attract a large number of talented people from developing countries, while the latter are faced with problems of losing productive talent. When the phenomenon of losing talent becomes serious, it becomes a problem named “brain drain” which damages the international competitive power of the sending countries concerned and slows the economic development. A good effect of the talent outflow phenomenon is that this migration can become a two-way movement. The return of expatriated talent is becoming common in international society. With advanced technology, knowledge, business know-how, and international networks acquired in developed countries, the returnees can contribute greatly to development in their home country. The challenge for the sending countries is how to attract the return of talent from overseas. What caused their choice of country? What might increase their intention to return? These questions are linked to the answer of another question: What makes a country attractive?

**Figure 1. Star scientists in a spiky world**



Source: (Florida, 2008, pp. 29)

China is fortunate to witness the return of a growing number of overseas talented people. The distribution of Chinese *haigui* inside the country is very uneven, which

applies to native educated talent as well. This unbalanced distribution of talent is a natural result of the unbalanced economic growth during the last three decades. When Deng Xiaoping initially designed economic growth-oriented policies for China, growth was more important than balance. The resulting uneven distribution of talent has aggravated regional economic differences in turn. However, the time has come for China to rethink its economic growth model and to launch “scientific development” as promoted by Hu Jintao in 2003. Among the major tasks in the scientific development model is reducing regional differences. To accomplish this task, it is important to reduce inequity in the attainments of talented people, who are the commonly recognized central driving force of economic growth.

How do the talented people choose a location inside a country? What may affect their preferences and decisions? What makes a city, a province, or a region more attractive than others? This thesis aims to answer these questions, too.

When making decisions regarding residential location in China, people are always confronted with the restrictions of the registered residence system, which is known as *hukou* (户口) in Chinese. Nevertheless, it is hard to control for the influence of *hukou* in empirical study relating the migration of highly qualified talent, which makes the existing literature sparse and often biased. Studying the choice behaviors of *haigui* offers us an easy approach to bypass the limitations of *hukou* because *haigui* have been offered local *hukou* by preferential policies, even in major cities where *hukou* is hardest to obtain.

Questions about locational choice seem easily answered. When asked about location choice, anyone can give reasons, such as better job opportunities, higher salary, sufficient goods for consumption, better medical and educational services, more diversified cultural goods and services, cleaner environment, proximity to beaches or mountains, connections with family and friends, more open and tolerant milieu, and so on. All of these factors are possible reasons for choosing one location



over another. However, there are always some conflicting observations. People move to richer places as well to poorer places. People move away from their family, but others move to be close to family. With all these possible answers, what exactly makes a place popular? People cannot always completely correctly evaluate their real decisions when they are asked to state the most influential factor. Some factors are taken granted or are not discussed. These biases in stated preferences further make the answers to this question unclear and vitiated the validity of most extant literature in which these biases were ignored. Moreover, the stated data is usually not readily prepared in every place. What is the mechanism by which a locational choice is made? This question is not easy to answer in depth.

The usual quick answer is intuitive - economic development. The observation that most people are going to economically developed places seems to justify this answer. However, this simple answer is not sufficient. It cannot explain why more *haigui* prefer Beijing over Shanghai, although the latter has a higher per capital level of GDP. It also cannot explain why so much overseas Chinese talents are willing to return, in spite of the higher economic level of developed countries. (For the purposes of this dissertation, talented people are referred to as “talents”.) Furthermore, it is not sufficient for the undeveloped regions because they also need to attract talent.

By studying the choice behaviors regarding location, this study offers an explanation for regional differences in the attainments of *haigui* talents and subsequent policy implications for alleviating them. Taking *haigui* as research subjects allows us to look into the question of “what make a place attractive to talents” while surpassing the bias caused by the limitations on migration derived from the *hukou* system. Previous research on locational choice or migration has seldom studied talents in China. This research will contribute to the literature on locational choice and migration by examining an empirical case in a developing country with robust economic growth.

The thesis is organized according to the following structure:

Chapter II gives a brief review of how the driving force of economic growth has changed historically and has shifted to talent nowadays. The latest research has emphasized people who add values to economic activities through their creativities and refers these people as a “creative class” . This chapter then explains why China needs the technology-centered creative strategy and why *haigui* talents matter in carrying out creative strategies and developing high-tech industries in contemporary China. Based on these discussions, the necessity is justified to take *haigui* talents as research subjects and examine their behavior in making locational choices. Overseas talents also need to be studied to find who are likely to become future *haigui*. Following the above realistic background, a review of the literature on migration and locational choices of highly skilled labor provides the academic background of this research. Lastly, the methodologies of locational choice are discussed and the one utilized in this thesis - the discrete choice model - is introduced.

Chapter III examines the locational choice on the country level of overseas Chinese talents and studies the factors affecting their intention to return. First, the general outflow and backflow trend of talents are reviewed to give a brief picture of overseas Chinese talents. By using the questionnaire survey data collected from graduates of a top Chinese university who are now living in Japan, an empirical analysis is then conducted. The underlying factors of their return intention are analyzed. These results assist in determining those likely to be future *haigui* talents. Based on the analysis results, China’s talent attraction policy will be discussed and suggestions will be made.

The next two chapters of this thesis are about choices of locations inside the country.

Chap IV first estimates the general distribution pattern of general *haigui* in Chinese provinces. It is to be noted here that *haigui* are referred as “general *haigui*”

in distinction to “*haigui* entrepreneurs” coming after. The data shows that the distribution of general *haigui* is extremely unbalanced, with the overwhelming majority of them living in the coastal area and very few in inland provinces. Then discrete choice model was adopted to analyze the individual level data, but it eventually failed because of insufficient information. Therefore, instead of the preplanned individual choice behavior analysis, a linear regression is used as an alternative method to uncover the factors affecting the stock of general *haigui*. The study does not only give suggestions on attracting *haigui*, but also sheds light on distribution of the whole talented people in the country and serves as a reference for policies regarding native-educated talents.

After returning to the country, *haigui* talents have had a presence in various kinds of occupations, especially as higher education professors, researchers, senior managers in transnational enterprises, and so on. In this thesis, special attention is paid to *haigui* entrepreneurs. Entrepreneurs, among all kinds of creative people, are especially important now because China needs to upgrade its industrial structure by developing industries that produce products or services with more added values, enhance the ability to transfer technology into direct economic productivity, and create more job opportunities to absorb the increasing number of college graduates. As a potential strength in the development of the high-tech industry, Chinese *haigui* entrepreneurs have caught the attention of local governments, which compete in attracting them.

Chapter V is formed in the similar structure to Chapter IV. It first describes the data collection of the number of *haigui* entrepreneurs in each province and made some estimation for missing data. The finding is that the distribution pattern of *haigui* entrepreneurs is similar to that of general *haigui*, with a majority concentrating in the coastal area, especially in Beijing and Shanghai. The difference is that the inequity in the stock of *haigui* entrepreneurs is more severe than that of general *haigui*. The reasons for this uneven distribution pattern are studied using the

discrete choice approach. The factors affecting the locational choices of *haigui* entrepreneurs are supposed to be different from those of employees. Thus, after taking into account a series of control variables for entrepreneurs, their locational choice behavior is studied in Chapter V.

Chapter VI summarizes the results from all previous chapters and discusses future research prospects. The results highlight the power of social connections to influence the locational choices of Chinese talents. The strongest result is that tolerance does not affect locational choices of *haigui* entrepreneurs while it appears to matter to general *haigui*, which will change the future research on creative class, by reminding researchers to distinguish employers and employees of creative class.

## References

- Arrow, K. J. (1962). The economic implications of learning by doing, *Review of Economic Studies*, Vol.29, No.3: pp.155-173.
- Becker, Gary S., (1964). *Human Capital*. New York: Columbia University Press for the National Bureau of Economic Research.
- Florida, R. L. (2002). *The rise of the creative class*. New York, NY: Basic Books.
- Florida, R. L. (2008). *Who's your city? how the creative economy is making where to live the most important decision of your life*. New York, NY: Basic Books.
- Islam, N. and Dai, E. (2009). Chapter 11: Alternative estimates of TFP growth in china: Evidence from application of the dual approach. In: Islam, N. (Ed.) *Resurgent China: Issues for the future*. Hampshire, UK/ New York, US: Palgrave Macmillan.
- Krugman, P. (1994). The myth of Asia's miracle. *Foreign Affairs*, Vol.73, No.6: pp.62-78.
- Lucas, R. E. Jr. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, Vol.22, No.1: pp.3-42.

Schultz, T. W. (1963). *The economic value of education*. New York: Columbia University Press.

Uzawa, H. (1965). Optimum technical change in an aggregative model of economic growth. *International Economic Review*, Vol.6, No.1: pp.18-31.

Young, A. (1995). The tyranny of numbers: confronting the statistical realities of the East Asian growth experience. *Quarterly Journal of Economics*, Vol.110, No.3 (August): pp.641-680.



## Chapter II: Literature Review and Background

### 1. The Role of Talent in Economic Development

#### 1.1. Shift to a people-centered perspective: creativity as the central driving force of contemporary economic development

During the last century, the driving force of economic growth has changed fundamentally in advanced countries. Factors such as natural resources (iron, coalmines, canals, seas, and rivers), markets, and capital used to be recognized as central to economic growth. Subsequently, it was recognized that advanced nations had shifted to information-based, technology-based, and, most commonly accepted, knowledge-based economies. Drucker (1993) outlined the rise of the knowledge economy, stating that “the basic economic resources-‘the means of production’, to use the economist’s term is no longer capital, nor natural resources...nor ‘labor’. It is and will be knowledge” (p. 8). The discussion began as early as the 1960s and has flourished since the 1990s (Machlup, 1962; Nonaka and Takeuchi, 1995; Jones, 1999; Brint, 2001).

However, Florida (2002) argued that the key driver of economic development should be creativity, a resource that is embedded in people. According to him, “*knowledge and information* are the tools and materials of creativity. *Innovation*, whether in the form of a new technological artifact of a new business model or method, is its product.” (p. 44) The resources that prior researches suggested are essential in economic growth—from the natural resources and attainments, to information and knowledge—are all recognized by Florida as inputs in the production process. Even the theory of human capital, which pays attention to the

importance of people, was also criticized by Florida et al. (2011) because “in the extant literature, labor had always been viewed as an important input in the process of firm location but was not, until the turn of the century, posited as independent factor that might contribute to urban growth.” (p. 59)

The research focusing on production inputs is from a firm-centered perspective in which the role of people has not been sufficiently emphasized. Influenced by Florida, a people-centered perspective, in which the creativity of people alone is recognized as the essential driver of urban economic development, has arisen in the academic world. An example is Parsons’s (2006) work in which human performance is viewed as a key factor in economic production. In this perspective, a person’s ideas are the most important input and output in an economy. Locations that are able to harness the means of cognition are as significant as (if not more than) those that harness the means of production (Polensky, 2007).

## **1.2. The background of the shift to creativity in Western economy**

In the process of accelerating globalization, the international order has undergone structural changes in the past three decades. Globalization has gradually but truly integrated international spatial expansion activities since 1980. After several historical events, such as the establishment of the European Union, the dissolution of the Soviet Union, the collapse of the Berlin Wall, the expansion of neo-liberal ideology, the belief in free trade, market mechanisms have been consolidated in the contemporary world. In the international market, national boundaries are gradually fading, followed by such phenomenon as the growth of import and export trade, the increase of foreign investment, and higher flexibility and mobility in capital as well as labor markets.

By expanding businesses to new markets and acquiring new investment opportunities in foreign countries, the advanced nations have largely benefited from globalization. On the other hand, these countries are also facing growing challenges



from their developing followers. With the obvious cost advantage, developing countries in Southeast Asia, Eastern Europe, and Latin America have grown as newly industrialized economies (NIE) and enhanced their international competitiveness. They became competitors of the highly developed countries, instead of mere investment opportunities. Under the cost pressure of labor, land, etc., developed countries, such as the US, England, German, and Italy cannot compete with the NIEs in most manufacturing industries. To avoid direct competition with NIEs, the developed countries have been driven to gain competitive advantages by their knowledge-intensive industries, which have higher added value. Consequently, new international order has emerged from the decline and outsourcing of manufacturing. This trend has accelerated in Western economies since the 1970s and has subsequently spurred many cities to look for alternative sources of vitality (Silver et al., 2011).

In the desire to maintain competitiveness and stand out in the globalizing world, many Western cities have turned their attention to the notion of creativity. Discussions and debates on creative issues, including creative class, creative industry, and creative city have been popularized against this background. Globalization, international division of labor, transform of economies in Western countries all led to the result that creativity became recognized as the central driving force in contemporary economic growth. Attracting inflows of creative people and tapping their potential have become essential for countries, regions, and cities.

The focus on creativity as economic power also has implications for cities in developing countries. Because of the open-door policy in 1978 and entry into the World Trade Organization in 2001, China is increasingly participating in globalization and is receiving growing effects from the international world. For the past three decades, China has seen the outsourced manufacturing from highly developed countries poured in and grew quickly. With the distinct advantage of cheap and abundant labor, the low end outsourced manufacturing has grown rapidly

in China. Largely relying on these manufacturing industries, China has grown into a NIE. However, such development model is gradually reaching its limit in China, with rising domestic labor costs and increasing pressure regarding environmental issues, natural resources and energy. As a solution, China is looking for a way to shift its central economic driving force, which means developing a creative economy. Nevertheless, the experience from the Western model can hardly be used directly because, after all, China is in a different phase of development compared to most Western countries. The following section compares the research on major creative issues and then summarizes the two types of creative strategies in Western countries, in order to find which is suitable for China. The discussions are aimed at answering the question about the kind of talents that China needs the most.

## **2. Towards a Creative China: What Kind of Talent Does China Need the Most?**

### **2.1. From human capital to creative class**

The power of talent in a place can be measured according to the share of highly skilled workers in a region at a given time. Traditional human capital theory measures skills on an educational basis, which is usually the attainment of a bachelor or higher degree. The definition of human capital as education and training was prevalent among economists dating from Becker (1964) and Mincer (1974) to heirs in the end of the 20th century, such as Glaeser (1994, 1998).

However, the latest theory of creative class proposes to measure skills on an occupational basis. The occupational approach measures the percentage of people engaged in “non-routine occupations that require creative problem solving and/or generation of new forms” (Florida, et al., 2001, p. 61). These people are employed to

come up with new ideas and better ways of doing things. Related occupations are computer programming, architecture, engineering, social science, education and library science, arts and entertainment, sports, media, managers, finance, law, health professionals and high-end sales (Florida, 2002).

Compared to the educational measure, the occupational approach is more precise in measuring the attainments of talent in a region, because it captures skills that are put directly into use. The people who supply these skills have acquired a threshold of skills and have been tested in practice. Thus, they can indicate a region's demand for this skill and reflect the potential to promote economic development. Resources that are not engaged in economic activity will not by themselves be a part of the growth process. The best example is a taxi driver with a doctoral degree, who should not be counted as source of key economic drivers unless he finds a job that makes use of his knowledge base.

Furthermore, the occupational measure surpasses the educational one in that it captures segments of the labor force that did not acquire skills in school. In some lines of work, skills are acquired informally on the job and are not recognized by a formal, measurable credential. For instance, the revolutionary and disruptive nature of entrepreneurial work often makes it incompatible with the proven lessons and established thinking that characterize university curriculums. Recent research in Sweden estimates that while 90% of degree holders have a creative job, only 25% of the creative class has a degree (Mellander, 2009).

Nowadays, the world economic situation is changing more rapidly than ever before. In order to keeping step with the changes and increasing the competitiveness, national as well as local governments need to inspire and utilize the creativity of people. Western countries have led the way far ahead in studying creative class. Countries with their own development history and economic situation have different focuses on talents, which leads to differences in creative strategies, as well as the research shaped in this context. Therefore, it is necessary to review the research on

creative issues.

## 2.2. The scope of creative class: distinguish the definition of creative class, creative industry, and creative city

Ever since the importance of creativity was recognized, a burgeoning body of studies has emerged discussing on various *creative* themes, including creative class, creative industry, creative economy, and creative city. Researchers, city managers, and mass media tend to shift these terms frequently, assuming that the keyword “creative” in these concepts are identical. However, these terms do not completely represent the same meaning. Although sharing the same keyword, they have very subtle but non-negligible differences, especially regarding whether to include the technological scope (Table 1).

**Table 1. The industrial coverage of various *creative* concepts by different researchers or institutes**

Key research fields	Culture-centred	Technology-centred		Representative Researcher/institute	Representative country
		IT	> IT		
<b>Theoretical research</b>					
Creative industry/ Creative economy	√	√		Creative Industries Task Force (DCMS, 2001)	UK
	√	√	√	Howkins(2001), with diploma in <i>international relations</i> (BA) and <i>urban design</i>	UK
	√			Caves(2000), specialized in <i>international trade and commerce</i> ; Americans for the Arts , 2005	USA
Creative class	√	√	√	Florida(2002), specialized in <i>regional economics</i>	USA, Sweden etc.
				A group of European researchers (Hansen and Niedomysl, 2009; Fritsch, 2007; Boschma and Fritsch, 2009)	
Creative city	√			Landary(2000), specialized in <i>urban planning</i>	UK
	√			UNESCO, 2004~	UN
<b>Empirical applications</b>					
Creative strategies of cities	√			The creative strategy in Asian, European cities, e.g. Singapore, Amsterdam, Berlin, Shanghai, London, Hongkong, Osaka, and Toronto.	

Source: summarized by the author.

### **2.2.1. Creative industry**

Department of Culture, Media and Sport (DCMS) of UK identified thirteen creative industries in 2001. Their work has become the most popular benchmark for identifying creative industries in other European and Asian countries (Foord, 2008). Recompiled in 2006, their list has several adjustments. Some items were combined or modified. The final list was shortened from 13 industries to 11, including advertising, architecture, arts and antique markets, crafts, design, designer fashion, film, video and photography, software, computer games and electronic publishing, music and the visual and performing arts, publishing, television, radio (DCMS, 2006). The following changes were made to categories in the 2001 version: “film, video and photography” was “film and video”; “music and the visual and performing arts” was “music and performing arts”; “software, computer games and electronic publishing” was “interactive leisure software” and “computer services.”

In the most influential list of creative industries by DCMS, the main focus is on culture-related industries. Technology-focused industry is on the list, but only occupies one seat. Only Information Technology (IT) related industry is mentioned. Other high-tech industries are not classified as creative industries. The majority of literature on creative industries has followed this trend and focused on culture-related industries. For example, Throsby (2007) summarized six models to classify creative industries, including the DCMS model, the WIPO (the abbreviation of World Intellectual Property Organization) copyright model (WIPO, 2003), Throsby’s (2007) concentric circles model, and so on. All these models are set up closely around culture-related industries. Technology-centered industries are either not included or peripherally positioned.

The leaning towards culture industries has affected many Asian and European countries, as popularized by the UK’s experience. Such leaning becomes more

obvious in countries influenced by the UK. In most countries with creative strategies, even the IT industry was not included as a creative industry. The list was shortened to include culture-related industries only.

The trend of narrowing creative industries into culture-related industries can also be observed in the US as early as Caves (2000). In “Americans for the Arts,” a report that Caves wrote for the US government in 2005, creative industries included the following 11 industries: advertising, architecture, arts schools and services, design, film, museums, zoos, music, performing arts, publishing, television and radio, visual arts. The narrowed list was adopted by government departments in the US. The culture-centered view has been adopted by UNESCO, whose criteria defining member creative cities include literature, film, music, media arts, design, gastronomy, crafts, and folk arts.

Despite the shorter lists compared to the UK, there are also scholars in the US who took a broader scope. Howkins (2001) proposed the most comprehensive list of creative industries. His list is based on DCMS’s 2001 list, but includes the extra field of research and development in science and technology. (He also added toys and games.) Not only the IT industry, but also other high-tech industries are included. He argues that R&D activities, mainly those that generate patents, should be counted as creative (Howkins, 2001).

As observed by Currid-Halkett and Stolarick (2011), studies on “creative economy” range from culture-related themes, such as media, religion, “taste-driven” industries, or grouping culture as a part of larger “creative class”. Their summary implies two trends in creative studies: culture-related and a wider scope that includes or even focuses on technology-related industries.

### **2.2.2. Creative class**

According to Florida (2002), “the creative class consists of people who add economic value through their creativity” (p. 68). The measure of a creative class is definitely not easy. It is more difficult than counting people who have bachelor

degrees. Whether a worker belongs to the creative class depends on what he or she primarily does in the work. However, it is not appropriate to count workers in creative industries, mainly because not all workers in a creative industry are creatively occupied. For example, a security guard in a music company is not a creative worker. This fact makes the measurement very complicated. Another reason why the creative class cannot be measured by industry is that the lists of creative industries in many countries are very short. As stated in section 2.2.1, in most cases the definition of creative industry does not include high-tech industries.

Howkins's (2001) definition of creative industry is the broadest and includes industries ranging from culture to high-tech (see Table 1). However, even in his definition, some occupations are excluded from the creative class. His notion does not include people doing academic research on non-scientific or non-technical subjects as creative workers. However, in the creative class structure defined by Florida (2002), university professors are in the super-creative core, so academic scholars in subjects besides scientific and technical subjects are also included.

Florida summarized four main types of creativity: (i) scientific creativity, (ii) technological or innovative creativity, (iii) economic or entrepreneurial creativity, (iv) artistic or cultural creativity (2002). By looking deeply into human creativity, Florida's definition of creative class has a broader scope than the definition of counting the number of workers in creative industries.

In addition, the notion of creative class suggests that even in traditional industries (i.e., non-creative ones), some people engage in creative work. The best example is the entrepreneur of a factory. Many creative workers would be excluded if only creative industries were focused on. These differences between creative class and creative industry suggest that it is arbitrary to use the terms without distinguishing them. Among the differences, two main aspects affect how to interpret creative strategies in cities: whether to take workers in high-tech industries and entrepreneurs in traditional industries into account or not.

### 2.2.3. Creative strategies in cities

The research on creative themes was popularized in recent decade and the creative city is one of the popular themes. Contemporary cities compete by harnessing every dimension of their asset bases. In most major global cities, urban managers have recognized “creativity” as a new, multifaceted resource.

Landary (2006) observed that the US has been very slow in seeing the link between creative industries and the creative city. This is only half the truth. In a narrow definition of creative industry (i.e. culture-centered), the US does fall behind other country’s agendas by engaging less in promoting culture-centered creative strategies. The reason is that the US is much stronger in high-tech industries. US scholars famous for creative studies, represented by Florida, have insisted on the importance of the technology-centered perspective. The research on creative study in the US is largely rooted in the observation that particular US cities, such as San Francisco, seem to attract creative producers. A large number of these case cities are actually advanced in technology IT, biotechnology, energy-technology and so on. For example, New York and London have found ways to develop as hubs for business and financial services (Sassen, 2001). Silicon Valley, Seattle, Barcelona, and the North Carolina research triangle developed into focal points for gathering the talented, creative individuals crucial for success in the “knowledge economies” (Reich, 1992; Becker, 1993; Florida, 2002).

In Florida’s *technology, talent, tolerance* (3Ts) model of attractive environment to creative class, the Technology Index is composed of two location quotations: technology-related and industry-related. The first captures the percentage of regional output contributed by high tech as a percentage of a nation’s high-tech output. The second measures the share of regional output contributed by high tech. “Both of the technology variables are based on industrial data, suggesting that places without concentrations of high-tech activity will not achieve significant levels of growth, regardless of their other measures” (Florida et al., 2011, p. 63).



The US's vast investment in the military has stimulated creativity and innovation for the generation of high-tech clusters (Hall, 1990). Thus, high-tech R&D, especially the information technology, has been initiated in US instead of elsewhere.

Contrary to the US's technology-centered creative strategy, the creative cities in Europe have developed in a different direction. As Landary (2000) has observed, "with the decline of existing resource and manufacturing industry, culture was seen as a savior for many cities in Europe and increasingly elsewhere" (p. 6). As the analysis of creative industries has shown, the UK has largely been inclined towards the culture-centered viewpoint and does not put much emphasis on technology-related industries. This inclination has affected many cities as the UK's notion of creative industry was popularized worldwide. Instead, research on creative cities pays more attention to culture, as stated by Landary, "cultural resources are the raw materials of the city and its value base....The task of urban planners is to recognize, manage and exploit these resources responsibly" (2000, p. 7).

Many world-leading cities have designed their own creative strategies on the UK model. Examples are Singapore, Amsterdam, Berlin, Shanghai, London, Hong Kong, Osaka, and Toronto. Increasingly, second- and third-tier cities have followed in their wake. UNESCO has built a creative network that had 29 members in February 2012. Close examination of their strategies reveals that most are culture centered. In most cities with the ambition to be creative, the tendency to culture-related industries has intensified and technology-related industries are left out.

In general, there are two theoretical streams of creative city strategies. One is European-style, which is a culture-centered strategy. The other one, US-style, is technology centered. Empirical experiences have shown that contemporary cities with creative strategies tend to be culture centered. Although US academia leads the research on the creative class, their results are not imitated as frequently as are those on the European-style. Landary (2006) observed that the US has been very slow in seeing the link between creative industries and the creative city. This has largely

limited the US's influence on other cities who are striving to be creative. However, it does not mean that the US is not developing creatively. The reality is that the US's development style is much more often referred to as the "high-tech city."

#### **2.2.4. Creative strategy necessary for China: technology-centered**

Different economic bases give birth to different creative strategies. Countries need to choose development strategies based on their own economic situations and design incentive policies corresponding to the focus of development strategies. As a developing country with a huge labor force, China developed an economy based on labor-intensive mass production. To achieve the next stage of development, China needs to harness people's creativity and develop a creative economy. Whether the prevailing culture-centered creative strategy suits China or not still needs to be discussed. Creative classes in cultural industries, such as artists, musicians, and so on are no doubt important and necessary. However, for a country with a huge population like China's, high-tech industry is more urgently needed because it can absorb a larger labor force. The US-style creative strategy, focusing on improving technology, may be more suitable for China. Correspondingly, the creative class China need more urgently are those who can contribute to the technology-centered industries, are in more urgent need for China, instead of those with artistic creativities.

How to increase such creative class in China should be considered from the global point of view, not limited to the country itself. According to Wallerstein (1974), the contemporary world can be interpreted as a system in which countries are designated either core or peripheral. Developed countries like the US, the UK, and Japan are in the core area, and developing countries are peripheral. This system does not only apply to economic power but also exists in education, academia, and technology. China's technological power has long lagged behind that of the core nations. It would take a huge R&D investment as well as a long period for China to reach a similar level if it relied only on itself. It is possible to accomplish technology and

knowledge transfer much more quickly by attracting talents from the core nations. The catch-up experience relying on return migration has proved successful in peripheral economies, such as Taiwan, Israel, and India. The huge stock of overseas Chinese talents is a good resource to utilize. With the international views, knowledge, technology, information, and business know-how obtained in developed countries, overseas talents comprises the creative people China needs. From the central to the local governments, the value of *haigui*, has been well noticed.

### 2.3. The role of *haigui* in the development of a creative China

Dai (2012) found that the occupational choices of *haigui* appeared to differ in regions and over time. In the latter half of the 1990s, when multinational companies flooded into China, Chinese *haigui* mostly chose to work in universities, public research institutions, or government departments. Gradually, they made a significant presence in the academic and higher educational worlds. For example, in 2004, 81 percent of members of the Chinese Academy of Sciences and 54 percent of members of Chinese Academy of Engineers had more than one year of overseas experience (Exhibition of Chinese Returnees' Entrepreneurship Achievements, 2004). Recently, the numbers of employers in overseas-funded enterprises and state-owned enterprises are also increasing (Dai, 2012).

However, along with improvement in the domestic educational environment, the rapid increase of domestic talent and increasing exchange with international society, the absolute superiority of *haigui* due to their scarcity has largely decreased. The phenomena of *haidai*(海待)<sup>1</sup> and *haizhao*(海找)<sup>2</sup> have arisen and gained intensive attention from the public. A series of related reports have provoked a discussion on “whether go abroad for study is worthy” across the country. The phenomena of

---

<sup>1</sup> Literally, *haidai* means “sea tangle”, which is a homonym of “sea” (*hai*, 海) plus “waiting” (*dai*, 待) in Chinese. It is used to indicate returnees who are unemployed and waiting for a job.

<sup>2</sup> Literally, *haizhao* means “seaweed”, which is a homonym of “sea” (*hai*, 海) plus “seeking” (*zhao*, 找) in Chinese. It is used to indicate returnees who are seeking job opportunities.

*haidai* and *haizhao* indicate that the aura of *haigui* has faded and employers in China evaluate talents rationally. *Haigui* are gradually being evaluated in terms of ability and face fair competitions with their native-trained counterparts in the job market.

When the absolute advantage of general *haigui* fading in the job market, a group of *haigui* entrepreneurs stand out for their great influence on high-tech industries. With new technologies and ideas obtained abroad, *haigui* have succeeded in establishing leading enterprises in many industries. Their efforts have largely narrowed the technology gaps between China and the developed countries. The creativity of *haigui* has become a great source of China's ability to develop to the next step. *Haigui* have become an indispensable force leading the country towards a "creative China."

The rapid economic development in China since the 1980s has been largely dependent on foreign-funded enterprises. Despite noteworthy achievements in economic growth, this way of development has gradually reached its limit. The industrial structure relying on low-end manufacturing has caused big pressure to the environment and resources. In the "smiling curve,"<sup>3</sup> which describes the value-adding potentials of different components of the value chain, manufacturing is at the bottom. Foreign-funded enterprises usually brought to China assembly manufacturing, which raises little added value to the final products. The two ends with high added values—patent and technology, brand and service—are always kept abroad. Thus, China cannot expect the foreign-funded enterprises to promote the economy into the next step.

Moreover, China has traditionally emphasized the anatomy of the national economy, which has been affirmed repeatedly by China's political leaders. Deng Xiaoping stated "Science and Technology are the Chief Productive Forces" for

---

<sup>3</sup> The concept of "smiling curve" was developed by Stan Shih, the CEO of Acer (a company headquartered in Taiwan) in 1992. It is used to illustrate the value-adding potentials of different components of the value chain in an IT-related manufacturing industry. It is also useful to describe other global sourcing industries (Zeleny, 2007).

multiple times in 1988 (Deng, 1993, p.274) and stressed the importance of technology in the post-communist vision of a modern, powerful economy. In 1995, Jiang Zemin, the Chairman of China at that time, stated that the country remains committed to becoming “masters of our own fate.” To achieve technological and economic autonomy, China needs to encourage its own high-tech enterprises instead of relying on foreign-funded firms. During the emergence and development of high-tech industries, the role of *haigui* has proved increasingly important to China as a peripheral country in the world’s technology system. Industries, such as IT, bio-medical, new materials, new energy, etc., and related Venture Capital (VC) companies have made tremendous progress because of the *haigui*’s participation.

Some might argue that China is able to cultivate its own creative outputs in the forms of new technologies from inside the country. Regarding why people are creative, it is argued that improving the environment can stimulate people’s creativity, such as division of labor (Adam Smith, 1776), knowledge variety (Marshall, 1920), creative interaction (Ford, 1996; Drazin et al., 1999), openness and dynamic contacts (Mumford et al., 2002; Martins and Terblanche, 2003) and, most recently, networks (Karlsson, 2011). The above factors describe the extrinsic environment. Meanwhile, other opinions hold that intrinsic motivation is more important for creativity than extrinsic motivation although extrinsic motivation may support intrinsic motivation (Amabile, 1996). It is implied that internal reinforcement mechanisms have greater importance for explaining the total creativity level of individuals than simple stimulative or coercion arguments. According to Karlsson (2011), it is difficult to stimulate the creative output of individuals, suggesting that the creative output of regions depends on its attainment of creative persons. To catch up with developed countries and learn from their experiences, it is a very effective way to make use of overseas talents and *haigui*.

In the background of worldwide economic setbacks and depression, a dynamic Chinese market has become increasingly attractive for overseas talents, especially

those interested in starting enterprises. Both central and local governments are engaged in developing various policies to attract them. However, are their policies efficiently designed? What are the factors that might affect the locational choices of talents? The next section gives a brief review of the relevant literature.

### **3. Factors Affecting the Locational Choices of Talents**

In his book, *Who's your city? How the creative economy is making where to live the most important decision of your life* (2008), Florida stated that people have three really important choices in their lives: what (job), who (spouse) and where (location). The choice of “where” is so important that it affects almost every aspect of one’s life. People’s mobility has increased greatly due to falling transport costs and the removal of some barriers to migration. Thus, there are increasing opportunities for individual choices of location. The set of feasible locations is especially large for creative people who usually have high affordability. Hence, it is necessary to study the factors affecting their locational choice behaviors and find factors attractive to them. The results should indicate the future direction of policies of retaining creative people.

Regarding the mechanism of migration, Lee (1966) developed a “push-pull” model that was widely accepted in subsequent research and fostered much discussion on detailed push/pull factors. Subject to the researcher’s preference, the lists of these factors can be exhaustive and varied. However, generally, emphases have been placed on several factors, such as economic factors, amenities (including natural and urban amenities), social connections, and more recently, the creative milieu.

People decide where to live based on the utility maximization process. The place they choose is where they can obtain the largest utility. The possible factors affecting choice of location increase or decrease the utility of a decision maker.

### 3.1. Economic factors

Among the various factors affecting an individual's utility, economic considerations, as emphasized in neo-classical theory, are recognized as the most dominant reason for the choice of migration destination. Neo-classical theory views a migrant as a producer, whose migration decision is to maximize the return from labor. This can be traced back to Sjaastad (1962), who divided the costs and returns of migration into "money" and "non-money" factors. The money returns of migration are an increment in a migrant's real earnings stream—in other words, the return to one's human capital, usually measured in income. The notion of migration for higher income prevails in the research on voluntary migration. For example, higher salaries offered in the host country are found to decrease the intention to return of overseas talents from countries like Turkey (Gungor and Tansel, 2008) and China (Zweig, 1997).

In Murata's (2003) research on the distribution of economic activities, following the logistics in the new economic geography (e.g., Krugman, 1991; Fujita et al., 1999), market factors or so-called product diversity are an agglomeration force accelerating the concentration of economic activities. A larger population in one region creates a greater variety of products, which tends to reduce the price index in that region in the presence of transportation costs. His model suggests that the nominal wage rate is higher in a more populous region due to the home market effect<sup>4</sup>, which implies that workers concentrate in a single region if they decide their residential locations by taking only market factors into account (Murata, 2003). This is obviously not consistent with the real world. Other factors besides economic income also affect people's locational choices.

In fact, economically active people now appear to give greater weight to other

---

<sup>4</sup> The term "home market effect" was defined by Krugman (1991) as "other things being equal, the wage rate will tend to be higher in the larger market."

factors besides local job opportunities in making their residential choices. This appears especially obvious in the observation that return migration has been frequently happened in developing countries despite significantly lower income levels than in the former host countries. Zhang's (2003) study suggested that overseas Chinese talents are willing to return when the income in the home country is not less than one third of that in the host country. Zeithammer and Kellogg (2010) estimated that the return rate of highly skilled Chinese migrants from the US will increase about three fold if the salary gap is narrowed to half of the current level. Such evidence suggests that economic reasons are not the only issue in choice of location and that neo-classical theory cannot completely explain it.

### **3.2. Amenity**

The effect of non-economic factors was noticed as early as the 1930s. Hicks (1932) observed "indirect attractions of living in certain localities." (p. 74). This is one of two main reasons why people settle despite lower wages and regional differences in wages, other than "differences in the cost of living." His observation focused on the other identity of a migrant, that is, as a consumer, who has idiosyncratic taste for living amenities, including natural and urban ones. About the factors influencing the destination choices of talents and attracting people to particular places, the change towards amenities in the 1970s has been captured by researchers (Svart, 1976; Rudzitis, 1989). Fotheringham et al. (2000) has confirmed this trend and asserted the focus of migrants has changed fundamentally towards amenities during the late 1990s.

The earlier literature on amenities mainly focused on natural amenities, such as climate and environmental beauty (Ullman, 1954). Sjaastad (1962) related migration to environmental factors, such as climate, smog and congestion. He started the discussion on the impact of the natural environment on people's locational choices and much of the succeeding literature maintained this focus. For example, Glaeser et



al. (1995) used regional dummies and concluded that “weather and other regional characteristics have played an important role in migration and hence the growth of cities” (p. 129). Glaeser et al. (2001) also found that the population growth of cities has a positive relationship with environment amenities, such as temperate climate, dryness, and proximity to the coast.

Besides natural factors, artificial amenities in an urban setting have also been considered by researchers, which can be dated back to Tiebout (1957), who first implied a relationship of urban amenities with migration, arguing that people vote with their feet by choosing cities that provides better public goods. Jacobs (1961) focused on how neighborhood environments, such as sidewalk safety, useful and enjoyable contacts, and parks (i.e., non-market interactions) affect residential configurations. Their followers find that talented migrants are increasingly “voting with their feet” (Findlay and Rogerson, 1993), attaching high values to amenities that lead to a more pleasant urban life, such as a variety of consumer services and goods, aesthetical and physical settings, good public services, and speedy transportation to make the city accessible (Glaeser, Kolko and Saiz, 2001). Also attractive is a “particular package of amenities,” including cafes, galleries, music, and a generally bohemian, tolerant atmosphere, which are strongly correlated with the presence of knowledge workers (Florida, 2002).

Urban amenities can be subdivided into two types according to whether they are market-provided or public-provided amenities. As the name indicates, the first type includes facilities like restaurants, cafes, bars, art galleries, specialty stores, which are mainly provided by the market. From a market perspective, these facilities should be interpreted as the result of concentrations of people, instead of reasons for the gathering of people (Holcombe, 2011), because those stores can stay in business only when there is sufficient clientele. Therefore, the supply of these kinds of amenities is supposed to be provided by the market and does not need government intervention. Whereas the latter, such as the availability of parks and recreational

opportunities (museums, theatres, etc.), professional sports franchises, transportation networks, public education and health care, etc. are provided and financed by the government as public goods. Public policy makers, urban planners and city managers can and should take care of these amenities.

It should be noted that the city managers can do little with amenities related to the natural environment, such as climate and proximity to beaches or mountains. Theoretically, the discussions on market-provided urban amenities as well as natural environment amenities are necessary for understanding the mechanism of migration. However, empirically, studies on natural environment amenities have limited implications for guiding city management and policymaking. As a result, among all types of amenities, the discussion on public-provided amenities is the most necessary and valuable.

Regarding the effects of publically provided urban amenities, there are on-going debates. For example, Buettner and Janeba (2009) have proved that publically provided goods, such as cultural offerings, act as an important pull factor for talents in Germany. Fritsch (2007) also did research in Germany and reached a similar conclusion that a high level of public supply of health care and education can explain the distribution of creative talents. Meanwhile, opposite evidence was found by Boschma and Fritsch (2009), who proved that in seven European countries, the provision of public facilities in health care and education had only a minor, if any, impact on the presence of talents, which is also true for the regional supply of cultural and recreational amenities. The results seem to differ across populations and regions. More studies are necessary to reach a universally applicable conclusion.

### **3.3. Social ties**

As mentioned above, Sjaastad (1962) divided the costs and returns of migration into “money” and “non-money” factors. He specified non-money factors, among which there are “psychic costs.” Psychic costs represent the emotional costs of

leaving one's familiar surroundings. Sjaastad's work contributed to the research on migration by offering the perspective that social relationships can affect one's utility and further influence on one's choice of location. This perspective is especially useful in interpreting the return migration from rich area to poorer one. For most people, adaption to being in an unfamiliar society costs extra energy, and getting close to familiar people could be an emotional comfort. Powdthave (2008) argued that people would settle for lower income<sup>5</sup> in the mother country, even factoring out the consumption issue<sup>6</sup> because pecuniary losses will be compensated for by being close to relatives and friends. Dahl and Sorensen's (2009) research found that entrepreneurial talents in Denmark placed much more emphasis on being close to family and friends than on regional characteristics that might influence the performance of their ventures when deciding where to locate their businesses.

Besides emotional needs, there is another possible interpretation for the effect of social ties on the migrant's choice of destination. Social ties can be beneficial for careers, as suggested by Saxenian (2001), and can act as social capital (Benson-Rea and Rawlinson, 2003). However, it is worth noting that whether a society with closer social networks would promote economic growth remains debatable. In the latest creative class theory proposed by Florida, the role of social capital was the opposite of making a city creative. He asserted that homogeneous communities that have strong ties among their members can have an adverse effect on growth, claiming that such environments often tend to suppress new ideas and creativity, and drive creative class out. Therefore, future potential cities are moving towards "places with looser networks and weaker ties" that "are more open to newcomers and thus promote novel combinations of resources and ideas" (Florida, 2004, p.31).

---

<sup>5</sup> The income needs to be higher than a physiological minimum threshold (Reichlova, 2005).

<sup>6</sup> Consumption might be cheaper in the home country. The gap between purchasing power in the home and host countries might not be as huge as the income gap. However, consumption price differences are becoming smaller across countries. In a world under accelerating globalization and internationalization, consumer goods are spreading worldwide, with almost the same prices for cars, electronic appliances, daily commodities like clothes, shoes, and so on.

### **3.4. Creative milieu**

Besides the above economic, amenity, and social factors, a creative milieu is also suggested to be attractive to talents. The features of a creative milieu can be summarized as the "3Ts" of *technology, talent, and tolerance* (Florida, 2002).

#### **Technology power**

Studies have demonstrated that technology is the main source of productivity growth early in the 1950s (Solow, 1956). This view of seeing exogenous technological progress as the engine of long-run growth was later imbedded in the model by Romer (1986, 1990), who was the first that formulated an explicit growth model with technical progress resulting from deliberate actions taken by private agents who respond to market incentives. Technology power (innovation) is the outcome of creativity, and in turn could be a good indication of an environment inductive to creative industry.

Technology can be measured either from the input side, such as R&D investment, which measures the share of R&D expenditures in the industrial output, and the Innovation Index, which measures from the output side in the form of per capital patents granted. Both indicators are tested in our models. Someone argues that the output side is usually more reliable for regional growth in the sense that high input does not necessarily lead to high output (Florida et al., 2008b). An third index of High-tech Index is also proposed, which measures both the size and concentration of a region's economy in growth sectors, such as software, electronics, biomedical products and engineering services, and so on (Florida, 2002).

#### **Talent power**

Talent power is considered as another feature of a competitive city. The role of talent in economic growth has been identified in many existing studies (Lucas, 1988; Mellander and Florida, 2006). Subsequent studies based on the work of Baumol (1968) have improved our understanding of the role of qualified talent pool in relation to technology, technological innovation and entrepreneurship (Lee, et al.,

2004; Acs and Armington, 2006; Audretsch, et al., 2005).

Talent power is usually measured by the share of highly educated workers in a region at a given time. Skills can be measured either on an educational basis (the attainments of a bachelor's degree or higher) or on an occupational basis. Traditional human capital models usually use educational measurement, while the latest theory of creative class proposed using occupational data.

### **Tolerance**

Tolerance is the most important feature of a creative milieu. A tolerant place is characterized as open and diversified. The importance of diversified urban settings was observed as early as Jane Jacobs (1961). Her subsequent work can be considered a further elaboration of this perspective, in which diversity is considered vital for urban development (Jacobs, 1969). Advocates have found evidence to support this idea. For example, Glaeser et al. (1992) tested the relationship between urban diversity and employment growth in cities and concluded that urban diversity and local competition encourage employment growth. In their work, the definition of "diversity" includes factors such as knowledge spillovers among different industries.

However, it is Florida who first introduced tolerance as a new answer to the question of why some places are better able than others to generate, attract, and retain creative people. Florida considered this focus on socio-cultural or non-market factors which economists have long neglected may be the greatest contribution of his approach (Florida et al., 2011). According to him, it is not (or not only) job opportunities or urban amenities that attract the creative class to a city (Florida and Gates, 2003). Competitive cities are those with "low barriers to entry," which are "known for diversity of thought and open-mindedness" (Florida, 2005, p.130) or in his term, "tolerance." According to Florida, tolerance, as a more fundamental and deeply rooted characteristic of a place, seeks to go beyond and go deeper than the previous focus on lifestyle, tastes, and amenities (Florida et al., 2011).

Florida argued that it is clear from the empirical literature that both talent and

technology are highly mobile factors, but they are more aptly characterized as flows, not stocks. However, what accounts for these flows? His argument emphasizes a key factor in realizing these flows: openness to human capital, and the more important, openness to diverse people. This openness requires tolerance, which is measured not through opinion surveys or attitude interviews but observed locational preferences.

In empirical studies, three key indicators have been frequently used to represent the tolerance of a place. They are designed based on finished migration choices, which reveal people's preferences for locations. High score of these indices reflect low barriers to entry for people. The Foreigner Index measures the percentage of a region's residents that were born in another country. The Bohemian Index measures the share of artists—a population that challenges convention perhaps more than any other. The Gay Index measures the fraction of the population made up of same-sex partners who reside in the same household (Florida, et al., 2011). Each index—foreigner, bohemia and homosexual—represents a population that has traditionally faced considerable discrimination and segregation and has been treated as outsiders. The rationale of these indexes is that a place without tolerance to new ideas would appear unfriendly, resulting in pushing the three populations out.

Among the three tolerance indices, the Gay Index is stressed as one of the best proxies for tolerance (Inglehart and Norris, 2003; Inglehart and Weltel, 2005). However, due to the lack of available data, its adoption is only limited to empirical studies in the US. Studies in European countries frequently adopt the Foreigner/ethnic Index (Hansen and Niedomysl, 2009; Fritsch, 2007) and the Bohemian index (Boschma and Fritsch, 2009; Hansen and Niedomysl, 2009) and use them to explain the distribution of the creative class.

It is difficult to use the above measurements of tolerance in the Chinese context. However, since the country has long restricted internal migration, tolerance can be measured by the share of the population in a region who are from other parts of the country, that is, without local registered residence (*hukou*), as proposed by Florida et

al. (2008).

#### **4. Methodology: Discrete Choice Analysis**

In the study of “what makes a place attractive”, a popular research method is to rate the attractiveness of a place according to various aspects of performance (Rogerson, 1999; Malecki, 2004; McCann, 2004), such as business climate, quality of life, and so on. Such ratings, which have been gaining popularity ever since the publication of the classic *Places Rated Almanac* (Boyer and Savageau, 1981), have attracted intensive attention from the media as well as policymakers. However, McCann (2004) interpreted its popularity such that it influences the way in which societal priorities are established and thus can be used to legitimate policies. In more extreme cases, they even “come to be regarded as ‘off the shelf’ solutions to complex economic development problems” (p. 1913). For the same reason, the rating method has been questioned by academia because seldom is there agreement on the variables to be included or the relative weight for achieving a proper measure of attractiveness (Rogerson, 1999). Thus, the rating method can be quite subjective. This arbitrariness could easily lead to the criticism that it facilitates policies in problematic priorities by emphasizing certain aspects (e.g., low tax rates) while overlooking some other aspects (e.g., social exclusion) (McCann, 2004). Malecki (2004) also argued that ratings with annual updates inevitably show change rather than stability over time, indicating that the measures are not robust and hence their usefulness is questionable.

Thus, instead of the rating method, the migration perspective is considered more convincing in the study of place attractiveness (Niedomysl, 2010). Two analytic methods are usually adopted according to different types of data. The first is a regression model using the aggregate data of research objects (e.g., highly skilled

labors, highly educated people, the creative class, etc.). Used as an independent variable, the macro data frequently adopted are as follows: 1) the *stock* of talents; 2) the *share* of talents in the population (taking the whole population into consideration); 3) the *in-migration rate* or *net migration rate* (taking both the flow as well as the magnitude of whole population into consideration). These kinds of analyses based on aggregate data have been widely adopted and offer academic explanations for the distribution of certain groups of people. However, people with the same skill/educational/occupational/backgrounds are treated as a group, and their taste heterogeneity in residential locations are ignored. Each individual is hidden behind the aggregated data like a drop in the ocean.

Another strand of literature dealing with micro data has been well developed in the migration perspective. Thus, the discrete choice model, which looks at the individual's decision-making process, is considered the most convincing comparing with all other research methods. By including personal information in the model, taste heterogeneities are accounted for. The progress in discrete choice theory, such as the works by McFadden (1974) and Anderson et al. (1992) have made this approach applicable.

There are two general types of micro data collection based on how people's preferences are observed. One is data on stated preference data, which are collected by asking people about their opinions of place attributes and their evaluation of the importance of these influences. The other type is data on revealed preference, which is obtained from observing the actual decisions of people.

The collection of data on stated preference has been adopted frequently and remains popular, such as in the works of Lieber (1978) and Nedomysl (2010). However in most cases, the collection of data on revealed preference is preferred by researchers. There is a concern that stated preference might be biased since people are tend to think differently when they are making a real decision compared to a virtual one. During the decision process, decision makers evaluate and weigh



different alternatives according to individual preferences and ultimately reach a final decision favoring a certain destination at the expense of others. The actual process of selecting a location is likely to be rather complicated so that the decision maker even might not be able to identify every possible factor. Efforts have been made to approach the real decision process, such as interviewing migrants who have considered more destinations than one as multiple alternatives are likely to reflect more extensively upon issues relating to the attractiveness of different places (Niedomysl, 2010). However, the arbitrariness of stated preference data still remains problematic.

The other type of micro data, which observes the choices that decision makers have already made, is more objective. It is assumed that the preferences of individuals are revealed in their choice of locations. It also has the merit of not consuming as much time and money as collecting the stated preference data by surveys.

#### **4.1. Introduction of discrete choice model**

The discrete choice model deals with problems in which decision makers choose from among a set of alternatives (Train, 2007). The full set of alternatives forms the choice set, which should satisfy the following three conditions: (i) alternatives need to be mutually exclusive, that is, if alternative A was chosen by one decision maker N, any other alternatives could not be chosen by the same person N; (ii) alternatives must be exhaustive, that is, all possible alternatives should be included in the choice set; (iii) the number of alternatives must be finite.

The first two requirements are not restrictive, because conditions (i) and (ii) can be satisfied by defining the choice set properly. However, the third requirement, which is the defining characteristic of the discrete choice model, cannot be fulfilled by redefining choice sets. It separates the application area of the discrete choice model from that of other regression models in which the dependent variable can

theoretically take an infinite number of values.

Theoretically, the choice set of a discrete choice model can include multiple alternatives. However, for a long time, the number of alternatives has been limited because of the computing technology at the time. Initially, it was only possible to deal with binary choice problems. Herzog et al. (1986) used a binary logit model to analyze the decision to leave or stay at the initial location. In this model, the choice set includes the observed place and others. Hence, the researcher can measure the characteristics of only two places: the observed origin and the “rest of the world” (or equivalently, the observed origin compared to the average of all the other origins in the sample). Because such studies measure place attributes at only one end of the long-distance move, they ignore or average out a significant amount of behaviorally relevant information on alternative places.

This binary logit approach has been adopted in many prior studies employing micro-data on older technology workers (Herzog et al., 1986; Bagchi-Sen, 2003). The approach has also been used in all studies employing micro-data on college-to-work migration, whether focused on technology workers or college graduates in general (Yousefi and Rives, 1987; Kodrzycki, 2001; Tornatzky et al., 2001; Hansen et al. 2003).

Researchers have long been equipped with theoretical tools, which were pioneered in McFadden’s (1973, 1976) contribution of econometric models. However, it was difficult to calculate multiple-choice problems at that time. Later on, along with the rapid development in computing technology and computer hardware, the restriction on calculation has been largely lifted and analysis of multiple choices has become manageable. Models with multiple alternatives in the choice set now are used in empirical researches.

Generally, four kinds of models dealing with multiple alternatives are available: the multinomial probit model, the conditional logit model, the nested logit model and the

mixed logit model.<sup>7</sup> Models inspired by McFadden have been applied to migration behavior in McFadden (1978), Schultz (1982), Fields (1982), Linneman and Graves (1983), Gabriel et al. (1987) and Davies et al. (2001), although not particularly for technology workers, new graduates, or doctoral graduates.

#### 4.1.1. Random Utility Model (RUM) as the theoretical base

In general, discrete choice models are usually derived in a RUM framework in which decision makers are assumed to maximize utility through decisions. Thurstone (1927) conceived the Law of Comparative Judgment based on the perceived intensity of psychical stimuli. This law points out that the perceived stimuli from alternative  $j$  contain an observed stimuli  $V_j$  and a random error  $\varepsilon_j$ . The perceived stimuli ( $V_j + \varepsilon_j$ ) was named as utility by Marschak (1960), and a choice model including a random error was derived, which called the random utility model.

RUM was derived based on two assumptions: (i) first, a decision maker  $n$  is assumed to choose from  $J$  alternatives. The utility for decision maker  $n$  choosing alternative  $j$  is denoted by  $U_{nj}$ , where  $j = 1, 2, \dots, J$ . The utility is known by decision maker  $n$  only. Anyone else, including the researcher, has no idea of this utility; (ii) second, the decision maker  $n$  is assumed to make a choice based on the maximization of his utility. So  $n$  only chooses alternative  $j$  when the  $U_{nj} > U_{nk}, \forall k \neq j$ .

The utility of an individual  $n$  that faces a choice set of  $J$  places can be represented by the following formula:

$$U_{nj} = V_{nj} + \varepsilon_{nj} = x_{nj}\beta + z_n\gamma + \varepsilon_{nj}; \quad j \in J, n \in N,$$

where  $U_{nj}$  is the utility that  $n$ th individual obtains by choosing  $j$ th alternative destination;  $V_{nj}$  is the observed utility (also called representative utility);  $x$  is a vector of attributes of destinations characteristics;  $z$  is a vector of attributes of individual

---

<sup>7</sup> Note that the term “mixed logit model” has changed over the past decades. It was used to distinguish it from the Multinomial logit model (ML) and the CL model, based on the variable of individual attributes or place attributes, or both. It is said that ML deals with only the attributes of subjects of choice behavior (i.e., individuals) and the CL model analyzes the attributes of the objects (i.e., the places), whereas the MXL model deals with both sides of choice behavior.

characteristics;  $\varepsilon_{nj}$  is the stochastic utility, which remains unobserved;  $\beta$  is a vector of alternative-specific coefficients;  $\gamma$  is a vector of individual-specific coefficients;  $J$  is the total number of alternatives; and  $N$  is the total number of individuals.

The location choice of an individual is the destination that maximizes his or her utility (Sjjastad, 1962). The probability that individual  $n$  chooses destination  $j$  is the probability that the utility of destination  $j$  exceeds that of all other destinations.

$$\begin{aligned}
 P_{nj} &= P(U_{nj} > U_{nk}), \forall k \text{ where } j, k \in J \text{ and } k \neq j \\
 &= P(V_{nj} + \varepsilon_{nj}) > P(V_{nk} + \varepsilon_{nk}), \forall k \neq j \\
 &= P(\varepsilon_{nk} - \varepsilon_{nj}) < P(V_{nj} - V_{nk}), \forall k \neq j
 \end{aligned}$$

This probability is a cumulative distribution. Using the density  $f(\varepsilon_n)$ , this cumulative probability can be written as

$$P_{nj} = \int_{\varepsilon} I(\varepsilon_{nk} - \varepsilon_{nj} < V_{nj} - V_{nk}, \forall k \neq j) f(\varepsilon_n) d\varepsilon_n,$$

where  $I(*)$  is the indicative function equal to 1 when the expression in parenthesis is true and 0 is otherwise. The probability is essentially a multidimensional integral over the density of the unobserved portion of utility  $f(\varepsilon_n)$ .

Depending on how the density function  $f(\varepsilon_n)$  was specified, we can obtain different discrete choice models. The assumption about the distribution of the unobserved utility decides which discrete choice model a researcher should use.

Among the various types of discrete choice models, the normal logit and conditional logit model are derived under the assumption that  $\varepsilon_n$  is independent and identically distributed (iid) extreme value. The nested logit model is derived under the assumption that  $\varepsilon_n$  is a type of generalized extreme value (GEV). Probit is derived under the assumption that  $f(*)$  is multivariate normal and mixed logit is derived under the assumption that  $\varepsilon_n$  comprises a part that follows any distribution desired by the researcher and a part that is iid extreme value.

#### 4.1.2. Conditional logit model<sup>8</sup>

McFadden (1973, 1978) showed that if the systematic portion of utility can be represented by an additively separable and linear parameter functional form, and the residuals  $\varepsilon_{ij}$  are independently and identically distributed with a type I extreme value distribution (also called Gumbel and type I extreme value distribution), then the probability that an individual  $n$  will choose destination  $j$  is given by

$$P_j = L_{nj}(\beta, \gamma) = \frac{e^{(x_{nj}\beta + z_n\gamma)}}{\sum_{i=1}^J e^{(x_{ni}\beta + z_n\gamma)}}.$$

The logit model has been widely used in the social sciences for its simplicity. However, the restrictions of this model are obvious: (i) first, it only considers systematic tastes, which are related with observed factors, but cannot deal with changes in stochastic tastes, which are represented in the unobserved factors. In other words, the logit model can reflect the taste heterogeneity, but only part of it; (ii) second, logit cannot deal with repeated choices over multiple time periods. If the factors affecting the multiple choices are independent over different periods, the logit model can capture the changes in utility brought by observed variables, such as the influence of one's previous choice on the new choice, or the lag response from the change of the affecting factors. However, the logit model cannot deal with the changes in unobserved utility over different periods, because it assumes that random errors are irrelevant in all alternatives. Despite these two restrictions, we can still obtain meaningful results by considering only observed utility. However, the third restriction from the IIA property is much stricter: (iii) the restrictive assumption of independence placed on  $\varepsilon_{nj}$  requires that for any individual, the ratio of choice probabilities of any two alternatives is independent from the utility of any other alternative. This implies that the odds ratio between any two alternatives should not change by the inclusion or exclusion of any other alternative, as shown by the

---

<sup>8</sup> The conditional logit model is also called the fixed effects logit model.

following formula:

$$\frac{P_{ni}}{P_{nm}} = \frac{e^{V_{ni}} / \sum_j e^{V_{ni}}}{e^{V_{nm}} / \sum_j e^{V_{nm}}} = \frac{e^{V_{ni}}}{e^{V_{nm}}} = e^{V_{ni}-V_{nm}},$$

The odds ratio of choosing  $i$  and  $m$  is irrelevant to any other  $j$  for any  $j \neq i$  or  $j \neq m$ . This is property has been labeled the “independence from irrelevant alternatives” (the IIA property). In reality, the IIA property is satisfied in the choice problems in most cases. In other cases, however, the IIA property might be violated. Chipman (1960) and Debreu (1960) discussed this possibility as the famous red bus/blue bus problem. What caused the red bus/blue bus problem is essentially the specification of a wrong choice set. Red bus and blue bus should not be considered two choices. Color is irrelevant when a commuter chooses transportation. Whether red or blue, they are both buses and should be united into one alternative—“bus”. In this case, it is easy to recognize similar alternatives and avoid defining the choice sets by irrelevant factors. However, in other situations, it might not be that easy to tell whether a choice set is appropriate or not.

In the situation of locational choice, alternatives are usually defined at the administrative level of provinces or cities, for example. However, this way of defining a choice set might not be appropriate. This chapter offers the following example to illustrate. For simplicity, suppose that a person  $A$  chooses a location in either *Beijing* or *Shaanxi*. No other locations besides these two provinces are available at first.  $A$  was equally likely to choose either of the two places (a metropolis or an inland province). The probability of choosing either province is 50%. Now suppose that *Hubei* also becomes available and it therefore enters  $A$ 's choice set. *Hubei* is an inland province similar to *Shaanxi*; therefore our observed decision maker  $A$  likes them equally in this case. If the IIA holds, then the probability of going to either province must now be 33.33% so that the *haigui* remains equally likely to go either to *Beijing* or *Shaanxi*. In reality, it is more likely that the probability of going to *Beijing* remains at 50% and the probabilities of going

to *Shaanxi* and *Hubei* are each 25%. Thus, the odds ratio of probability in choosing *Beijing* or *Shanxi* changes from 1:1 to 2:1, which means that the IIA property is violated.

Therefore, testing the IIA property is essential for ensuring the choice set is properly defined, which is crucial in the successful use of a logit model. If the IIA property is not satisfied, the results obtained from the wrong choice set will be twisted. Two methods are available to test if the IIA property holds among the alternatives—the Hausman-McFadden test and the likelihood ratio (LR) test. They will be introduced below in subsection 4.2.

#### **4.1.3. Nested logit model**

The IIA property requires the odds ratio of two alternatives independent from a third alternative. As illustrated above, in reality, including or excluding a third place (e.g., *Hubei*) very likely breaks the balance of probability in choosing from two places (e.g., *Beijing* and *Shaanxi*), especially when the new place (e.g., *Hubei*) is similar to one of the two (in this case, *Shaanxi*). In this case, the conditional logit model is not the appropriate model to use.

Generalized extreme value (GEV) models have been invented to release the IIA assumption, such as the nested logit, multinomial probit, and mixed logit models. GEV models assume that the error terms are distributed according to a generalized extreme value distribution. The most widely used member of the GEV family is the nested logit (NL) model. Daly (1978), McFadden (1978), and Williams (1977) separately proved that the nested logit model is consistent with utility maximization. Later, the nested logit model was widely used in the research on the choice of energy supplier (Train, 1986), transportation (Forinash and Koppelman, 1993), residence (McFadden, 1978), telephone service (Train et al., 1987), and so on.

Nested logit analysis allows us to relax the IIA assumption of conditional logit by grouping similar alternatives into nests. In China's case, we can group *Shaanxi* and *Hubei* into one nest that encompasses similar inland provinces, other nests can also

be generated if necessary.

Nested logit analysis has another merit over conditional logit model because it solves the problem of degrees of freedom for the lack-of-fit. In this research, there are alternative provinces with too few cases. With those provinces, the numbers of cases are too low for analysis using the logit model with case-specific variables, thus causing degrees of freedom for the lack-of-fit. However, by grouping them into one nest, this problem can be avoided.

Nested logit analysis uses decision trees, which are often interpreted as implying that the highest-level decisions are made first, followed by decisions at lower levels. However, no such temporal ordering is necessarily implied (Henscher et al., 2005). Instead, nested logit models are appropriate because they have groups of alternatives that are similar to each other within the nest in unobserved ways; in other words, they are appropriate when there is a correlation for unobserved reasons between the alternatives in each nest but no correlation between alternatives in different nests.

Suppose we have a decision tree on two levels, with  $K$  optional nests at the upper level and a total of  $J$  alternatives at the bottom level. In a random utility model (RUM) framework, by selecting alternative  $j$ , the decision maker  $n$  can obtain utility:

$$U_{nj} = V_{nj} + \varepsilon_{nj} = x_{nj}\beta + z_n\gamma + \varepsilon_{nj},$$

where  $V_{nj}$  is the deterministic part of utility (observed) and  $\varepsilon_{nj}$  is the random part (unobserved);  $x_{nj}$  are the alternative-specific variables and  $z_n$  represent individual-specific variables. The set of errors  $\varepsilon_{n1}, \varepsilon_{n2}, \dots, \varepsilon_{nJ}$  are assumed to follow the generalized extreme-value (GEV) distribution, which is a generalization of the type I extreme value distribution that allows for alternatives within nests of the tree structure to be correlated. For any two alternatives,  $j$  and  $m$  in nest  $B_k$ ,  $\varepsilon_{nj}$  are correlated with  $\varepsilon_{nm}$ . For any two alternatives in different nests, the unobserved portion of utility needs to be uncorrelated:  $\text{cov}(\varepsilon_{nj}, \varepsilon_{nm}) = 0$  if  $j \in B_k$ ,  $m \in B_l$  and  $l \neq k$ .



Let  $\rho_k$  denote the correlation in nest  $k$ , and define the dissimilarity parameter  $\lambda_k = \sqrt{1 - \rho_k}$ . A high  $\lambda_k$  means greater independence and less correlation, that is, the alternatives in the nest are less similar for unobserved reasons. The term  $\lambda_k = 0$  implies that alternatives in nest  $k$  are perfectly correlated, whereas  $\lambda_k = 1$  implies independence. For the nested logit model to be consistent with a random utility model,  $\lambda_k$  must be within the region that  $0 < \lambda_k < 1 \quad \forall k$  (Henscher et al., 2005).

The probability that alternative  $j \in B_k$  was chosen is equal to the probability that nest  $B_k$  is chosen multiplied by the probability that alternative  $j$  is chosen given that an alternative in  $B_k$  is chosen:

$$P_{nj} = P_{nB_k} \times P_{nj|B_k},$$

where  $P_{nj|B_k}$  is the conditional probability of choosing  $j$  given that an alternative in nest  $B_k$  is chosen, and  $P_{nB_k}$  is the marginal probability of choosing nest  $B_k$ . These conditional and marginal probabilities take the form of logits and thus can be written as (Train, 2007):

$$P_{nB_k} = \frac{e^{z_n \gamma + \lambda_k I_{nk}}}{\sum_{l=1}^K e^{z_n \gamma + \lambda_l I_{nl}}}$$

and 
$$P_{nj|B_k} = \frac{e^{x_{nj} \beta / \lambda_k}}{\sum_{j \in B_k} e^{x_{nj} \beta / \lambda_k}},$$

where  $K$  is the number of nests in the first level. The inclusive value for the  $k$ th nest corresponds to the expected value of the utility that the decision maker  $n$  obtains by choosing an alternative in nest  $k$ :

$$I_{nk} = \ln \sum_{j \in B_k} \exp(x_{nj} \beta / \lambda_k).$$

The inclusive value  $I_{nk}$  links the two levels of the nested logit model by bringing information from the bottom level into the upper level. Essentially,  $\lambda_k I_{nk}$  captures the expected value of utility to individual  $n$  of the alternatives available in nest  $B_k$ . Recall that  $\lambda_k$  reflects the degree of independence among the unobserved portions of utility for the alternatives in nest  $B_k$ . It is important that the inclusive value is entered

as an independent variable in the first level. The utility individual  $n$  chooses in nest  $B_k$  is made up of two parts: (i) the utility he or she receives regardless of which alternative he or she chooses in the nest, that is, the part of utility obtained from case-specific variables  $x_{nj}\beta$ ; (ii) the expected extra utility that he or she receives from being able to choose the best alternative in the nest, which is  $\lambda_k I_{nk}$ .

Given the inclusive values, we can show that the probability that decision maker  $n$  who wants to maximize his or her utility chooses the nest  $B_k$  in the first level; alternative  $j$  in the second level is

$$P_{nB_kj} = \frac{e^{\bar{z}_n\gamma + \lambda_k I_{nk}}}{\sum_{l=1}^K e^{\bar{z}_n\gamma + \lambda_l I_{nl}}} \times \frac{e^{x_{nj}\beta / \lambda_k}}{\sum_{j \in B_k} e^{x_{nj}\beta / \lambda_k}}$$

It can also be written as:

$$P_{nj} = \frac{e^{V_{nj} / \lambda_k (\sum_{j \in B_k} e^{V_{nj} / \lambda_k})^{\lambda_k - 1}}}{\sum_{l=1}^K (\sum_{j \in B_l} e^{V_{nj} / \lambda_l})}$$

From this equation, we can obtain the ratio of probabilities for two alternatives  $i \in B_k$  and  $m \in B_l$ :

$$\frac{P_{ni}}{P_{nm}} = \frac{e^{V_{ni} / \lambda_k (\sum_{i \in B_k} e^{V_{ni} / \lambda_k})^{\lambda_k - 1}}}{e^{V_{nm} / \lambda_l (\sum_{m \in B_l} e^{V_{nm} / \lambda_l})^{\lambda_l - 1}}}$$

If  $k = l$ , that is, alternative  $i$  and  $m$  are from the same nest, then

$$\frac{P_{ni}}{P_{nm}} = \frac{e^{V_{ni} / \lambda_k}}{e^{V_{nm} / \lambda_l}}$$

This equation is evidence that the ratio is independent of all other alternatives, that is, the IIA property is satisfied within nests. In contrast, if  $k \neq l$ , that is, alternative  $i$  and  $m$  are in different nests, then the ratio of probabilities still depends on the attributes of all alternatives in the nests that contain  $i$  and  $m$ . Please note that the probabilities still do not depend on the attributes of alternatives that are not in the nests  $k$  or  $l$ , which is called independence from irrelevant nests (IIN) (Train, 2007). Thus, compared with a normal logit model, by using a nested logit model we obtain relaxation of the IIA assumption in two ways: (i) IIA over alternatives in each nest,

and (ii) IIN over alternatives in different nests.

## 4.2. Testing methods of IIA property

### 4.2.1. Hausman-McFadden's test

IIA property can be tested with Hausman's specification test. According to Hausman and McFadden (1984), if a subset of choice alternatives is irrelevant, it can be omitted from the sample without changing the remaining parameters systematically.

Hausman's specification test is distributed as  $\chi^2$  with  $k$  degrees of freedom (equal to the number of independent variables) and can be written as

$$\chi^2 = (\hat{\beta}_U - \hat{\beta}_C)' [\hat{V}_U - \hat{V}_C]^{-1} (\hat{\beta}_U - \hat{\beta}_C),$$

where  $\hat{\beta}_C$  and  $\hat{V}_C$  represent parameter estimates and variance-covariance matrix from the model where one alternative was omitted, and  $\hat{\beta}_U$  and  $\hat{V}_U$  represent parameter estimates and variance-covariance matrix from the full model. We then examined the obtained  $\chi^2$  and the  $p$ -value. If  $\chi^2 > 0$  and  $p\text{-value} < 0.05$ , it means systematic differences exist between the two sets of parameters, and the IIA property is violated on the significant level of 5%.

### 4.2.2. Likelihood-ratio(LR) test

Another test available is the likelihood ratio test (LR). A likelihood-ratio test is a statistical test for making a choice between two hypotheses based on the value of likelihood ratio. The test statistics for the LR-test is calculated by the following formulas:

$$\chi^2 = -2 \ln \frac{L_C}{L_U} \sim \chi^2(k) = 2(\ln L_U - \ln L_C) \sim \chi^2(k),$$

where  $L_C$  is the likelihood of the constrained model with one alternative omitted, and  $L_U$  is the likelihood of the unconstrained model with full set of alternatives.

The likelihood ratio test for the nested logit model is distributed as  $\chi^2$  with degrees

of freedom equal to the difference in dimensionality of alternative sets between the constrained and unconstrained models (Wilks, 1938). (To illustrate, if one alternative was omitted to conduct the LR-test, then the difference between the constrained and unconstrained models is one. Subsequently, the degree of freedom for the  $\chi^2$  distribution is also one.)

If the null hypothesis is true, that is, the IIA property holds, then the constraint does not make much difference, and the difference between the log-likelihood values is likely to be small, resulting in a small  $\chi^2$  statistic. If the null hypothesis is false, then the constraint matters and the difference between the log likelihood is likely to be large, resulting in a large  $\chi^2$  statistic. In this case, the specification of the nests does not meet the requirements of the IIA property.

#### **4.2.3. A clarification of the likelihood-ratio test in nested logit model results using STATA**

In the data analysis and statistical software named STATA, the results of nested logit regression also report the results of the LR test. In this LR test, the constraint is the dissimilarity parameters  $\lambda_k = 1 \forall k$ .

From the results, we know that STATA reports coefficient ( $\lambda_k$ ) on the inclusive value ( $I_{nk}$ ). As discussed above,  $\lambda_k$  reflects the degree of independence among the unobserved portions of utility for the alternatives in each nest. A high  $\lambda_k$  means greater independence and less correlation, that is, the alternatives in the nest are dissimilar (for unobserved reasons). For the nested logit model to be consistent with a random utility model,  $\lambda_k$  must be within the region of  $0 < \lambda_k < 1 \forall k$ .

If there is only one alternative in nest  $k$ , we have  $\lambda_k = 1$  and this nest is degenerated. By the way, during the estimation process, to take the degenerate nature into account, we should constrain  $\lambda_k = 1$  ( $\forall$  province  $k$  forms one nest itself) by using STATA's constraint command; otherwise, the result might be inaccurate. (In our case, if there is a nest that contains only one place, let it be *Beijing*; then it is necessary to constraint  $\lambda_k = 1$  for this *Beijing* nest.)

If  $\lambda_k = 1 \quad \forall k$ , then we have complete independence and the nested logit reduces to a standard logit model. An LR test is reported to see if the standard logit model is better, with the null assumption being  $\lambda_k = 1 \quad \forall k$ . The positive  $\chi^2$  with p-value less than 0.05 will fall in the acceptance region and means the null assumption cannot be rejected. Otherwise,  $\chi^2$  falls into rejection region and proves that IIA does not hold among the alternatives in the standard logit model. Thus we can reject the null and prove the nested logit is thus proved that nested logit model performs better than the logit model.

This LR test is viewed as a IIA test and many researchers compared with Hausman's test, reaching the conclusion that there is weakness in this LR test of IIA because the results depend on exactly how the decision tree is specified. In other words, different specifications of the decision tree can lead to conflicting results in the LR test. Hausman's test of IIA is better because it does not depend on the tree structure specified in the nested logit model. This interpretation is wrong because it mistakenly takes the constraint shown here ( $\lambda_k = 1 \quad \forall k$ ) and the constraint in Hausman's test (one or more alternatives omitted) to be the same. By using the same constraint of omitting alternatives, both the LR test and Hausman's test should be independent from the decision tree specification.

## References

- Acs, Z. J., and Armington, C. (2006). *Entrepreneurship, geography, and American economic growth*. New York: Cambridge University Press.
- Amiabile, T. M. (1996). *Creativity in Context*. Boulder, CO: Westview.
- Anderson, S. P., Palma, A. de, and Thisse, J.F. (1992). *Discrete choice theory of product differentiation*. Cambridge: MIT Press.
- Audretsch, D. B., Lehmann, E. E. and Warning, S. (2005). University spillovers and new firm location. *Research Policy*, Vol.34, No.7: pp.1113-1122.
- Bagchi-Sen, S. (2003). An empirical analysis of migration in information-intensive work in the United States. *The Services Industry Journal*, Vol.23, No.1: pp.136-166.
- Baumol, W. (1968). Entrepreneurship in economic theory. *The American Economic Review*, Vol.58, No.2: pp.64-71.
- Becker, G. S. (1993). *Human capital: a theoretical and empirical analysis, with special reference to education*. Chicago, IL: University of Chicago Press.
- Benson-Rea, M. and Rawlinson, S. (2003). Highly skilled and business migrants: Information processes and settlement outcomes. *International Migration*, Vol.41, No.2: pp.59-79.
- Boschma, R. A. and Fritsch, M. (2009). Creative class and regional growth: empirical evidence from seven European countries. *Economic Geography*, Vol.85, No.4: pp.391-423.
- Boyer, R., and Savageau, D. (1981). *Places rated almanac: your guide to finding the best places to live in America*. Chicago: Rand McNally.
- Brint S. (2001). Professionals and the knowledge economy: rethinking the theory of the postindustrial society. *Current Sociology*, Vol.49, No.1: pp.101-132.
- Buettner, T., and Janeba, E. (2009). City competition for the creative class. *Working Paper, Ifo* Institute for Economic Research, mimeo.
- Caves, R. E. (2000). *Creative industries*. Cambridge, Massachusetts/London: Harvard University Press.
- Currid-Halkett, E., Stolarick K. M. (2011). The arts: not just artists (and vice versa). In: Andersson,

- D. E., Andersson, A. E. and Mellander, C. (Eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.
- Dahl, M. S. and Sorenson, O. (2009). The embedded entrepreneur. *European Management Review*, Vol.6, No.3: pp.172-181.
- Dai, Erbiao (2012). *New immigrants and Chinese economic development: From brain drain to brain circulation*. Tokyo: Taga Shuppan. [Translated from Japanese 戴二彪 (2012 月). 新移民と中国の経済発展——頭脳流出から頭脳循環へ. 東京: 多賀出版.]
- Daly, A. (1978). Improved multiple choice models. In Hensher, D., Dalvi, M. (eds.) *Determinants of travel choice*. Sussex: Saxon House.
- Davies, P., Greenwood, M., and Li, Haizheng (2001). A conditional logit approach to U.S. state-to-state migration. *Journal of Regional Science*, Vol.41, No.2: pp. 337-360.
- Deng, Xiaoping (1993) *Selected works of Deng Xiaoping (Volume III)*. Beijing: People's Literature Publishing House. [Translated from 邓小平(1993)邓小平文选第三卷.北京:人民文学出版社.]
- Department of Culture, Media and Sport (DCMS) (2001). *Creative industries mapping document 2001*. London, UK: DCMS.
- Department of Culture, Media and Sport (DCMS) (2006). *Creative industries statistical estimates statistical bulletin*. London, UK: DCMS.
- Drazin, R., Glynn, M. A., and Kazanjian, R. K. (1999). Multilevel theorizing about creativity in organizations: a sense-making perspective. *Academy of Management Review*. Vol.24, No.2: pp.286-307.
- Florida, R. L. (2002). *The rise of the Creative Class*. New York, NY: Basic Books.
- Florida, R. L. (2004). *The rise of the creative class (Revised paperback)*. New York: Basic Books.
- Florida, R. L. (2005). *Cities and the creative class*. New York: Routledge.
- Florida, R. L., and Gates, G. (2003). Technology and tolerance: the importance of diversity to high-technology growth. In: Clark, T. N. (ed.) *The City as an Entertainment Machine (Research in Urban Policy, Volume 9)*, Emerald Group Publishing Limited, pp.199-219.
- Florida, R. L., Mellander C. and Adler P. (2011). The creative class paradigm. In: Andersson, D. E.,

- Andersson, A. E. and Mellander, C. (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.
- Florida, R. L., Mallander C. and Stolarick, K. (2008b). Inside the black box of regional development: human capital, the creative class and tolerance. *Journal of Economic Geography*, Vol.8, No.5: pp.615-649.
- Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*. Vol.21, No.4: pp.1112-1142
- Forinash C. and Koppelman, F. (1993). Application of nested logit models of intercity mode choice. *Transportation Research Record*, No.1413: pp.98-106.
- Fotheringham, A. S., Champion T., Wymer C. and Coombes M. (2000). Measuring destination attractiveness: a migration example. *International Journal of Population Geography*, Vol.6, No.6: pp.391-421.
- Fritsch, M. (2007). The geography and the effect of creative people in Germany. *Jena Economic Research Papers*, No.2007-001: pp.1-32.
- Fujita, M., Krugman, P. and Venables, A. J. (1999). *The spatial economy*. Cambridge: MIT Press.
- Gabriel, S., Justman, M., Levy, A. (1987). Place-to-place migration in Israel: estimation of a logistic model. *Regional Science and Urban Economics*, Vol.17, No.4: pp.595-606.
- Glaeser, E. L. (1994). Cities, information, and economic growth. *Cityscape*. Vol.1, No.1: pp.9-47.
- Glaeser, E. L. (1998). Are cities dying? *Journal of Economic Perspectives*, Vol.12, No.2: pp.139-160.
- Glaeser, E. L., Kallal, H. D., Scheinkman, J. A. and Shleifer, A. (1992). Growth in cities. *Journal of Political Economy*, Vol.100, No.6: pp.1126-1152.
- Glaeser, E. L., Kolko, J. and Saiz, A. (2001). Consumer city. *Journal of Economic Geography*, Vol.1, No.1: pp.27-50.
- Glaeser, E. L., Scheinkman J. A. and Shleifer, A. (1995). Economic growth in a cross-section of cities. *Journal of Monetary Economics* Vol.36, No.1: pp.117-143.
- Güngör, N.D. and Tansel, A. (2008). Brain drain from Turkey: an investigation of students' return intentions. *Applied Economics, Taylor and Francis Journals*, Vol.40, No.23: pp.3069-3087.



- Hansen, S., Ban, C., Huggins, L. (2003). Explaining the "brain drain" from older industrial cities: the Pittsburgh region. *Economic Development Quarterly*, Vol.17, No.2: pp.132-147.
- Hansen, H. K. and Niedomysl, T. (2009). Migration of the creative class: evidence from Sweden. *Journal of Economic Geography*, Vol.9, No.2: pp.191-206.
- Hausman, J. A. and McFadden, D. L. (1984). Specification tests for the multinomial logit model. *Econometrica*, Vol.52, No.5: pp.1219-1240
- Henscher, D. A., Rose, J. M. and Greene, W. H. (2005). *Applied choice analysis: a primer*. New York: Cambridge University Press.
- Herzog, H., Schlottmann, A. and Johnson, D. (1986). High-technology jobs and worker mobility. *Journal of Regional Science*, Vol.26, No.3: pp.445-459.
- Hicks, J. R. (1932). *The theory of wages*. London: Macmillan.
- Holcombe, R. G. (2011). Cultivating creativity: market creation of agglomeration economies. In: Andersson, D. E., Andersson, A. E. and Mellander, C. (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, USA: Edward Elgar.
- Howkins, J. (2001). *The creative economy: how people make money from ideas*. London: Penguin Books.
- Inglehart, R. and Norris, P. (2003). *Rising tide*. New York, Cambridge: Cambridge University Press.
- Inglehart, R. and Welzel, C. (2005). *Modernization, cultural change and democracy*. New York, Cambridge: Cambridge University Press.
- Jacobs, J. (1961). *The death and life of great American cities*. New York: Random House.
- Jacobs, J. (1969). *The economy of cities*. New York: Random House.
- Jones, A. B. (1999). *Knowledge capitalism: business, work and learning in the new economy*. Oxford: Oxford University Press.
- Karlsson, C. (2011). Clusters, network and creativity. In: Andersson, D. E., Andersson, A. E. and Mellander, C. (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.
- Kodrzycki, Y. (2001). Migration of recent college graduates: evidence from the national

- longitudinal survey of youth. *New England Economic Review*, January/February: pp.13-34.
- Krugman, P. (1991). Increasing returns and economic geography. *Journal of Political Economy*, Vol.99, No.3: pp.483-499.
- Landary, C. (2000). *The creative city: a toolkit for urban innovations*. London/Sterling, VA: Earthscan.
- Landary, C. (2006). Lineages of the creative city. *Research Journal for Creative Cities*. Vol.1, No.1: pp.15-23.
- Lee, E. S. (1966). A theory of migration. *Demography*, Vol.3, No.1: pp.47-57.
- Lee, S. Y., Florida, R. and Acs, Z. J. (2004). Creativity and entrepreneurship: A regional analysis of new firm formation. *Regional Studies*, Vol.38, No.8: pp.879-91.
- Lieber, S. R. (1978). Place utility and migration. *Geografiska Annaler. Series B, Human Geography*, Vol.60, No.1: pp.16-27.
- Linneman, P., Graves, P. (1983). Migration and job change: a multinomial logit approach. *Journal of Urban Economics*, Vol.14, No.3: pp.263-279.
- Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, Vol. 22, No.1: pp.3-42.
- Machlup, F. (1962). *The production and distribution of knowledge in the United States*. Princeton: Princeton University Press.
- Malecki, E. J. (2004). Jockeying for position: what it means and why it matters to regional development policy when places compete. *Regional Studies*, Vol.38, No.9: pp.1101-1120.
- Marschak, J. (1960). Binary choice constraints on random utility indication. In: Arrow, K., (ed.) *Stanford Symposium on Mathematical Methods in the Social Sciences*. Stanford, California: Stanford University Press, pp.312-329.
- Marshall, A. (1920). *Principles of economics* (8th edn.). London: Macmillan.
- Martins, E. C. and Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, Vol.6, No.1: pp.64-74.
- McCann, E. J. (2004). "Best places": interurban competition, quality of life and popular media discourse. *Urban Studies*, Vol.41, No.10: pp.1909-1929.

- McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. In: Zarembka, P. (ed.) *Frontier in econometrics*. New York: Academic Press.
- McFadden, D. (1976). Quantal choice analysis: a Survey. *Annals of Economics and Social Measurement*, Vol.5, No.4: pp.363-390.
- McFadden, D. (1978). Modeling the choice of residential location. In: Karlqvist, A., Lundqvist, L., Snichars, F., Weibull, J. (eds.) *Spatial interaction theory and planning models*, Amsterdam: North-Holland, pp.105-142.
- Mellander, C., and Florida, R. (2006). *Human capital or the creative class – Explaining regional development in Sweden*. KTH/CESIS Working Paper Series in Economics and Institutions of Innovation. Stockholm: KTH Centre of Excellence for Science and Innovation Studies.
- Mincer, J. (1974). *Schooling, experience, and earnings, human behavior & social institutions no.2*. New York, NY: National Bureau of Economic Research.
- Mumford, M. D., Scott, G. M., Gaddis, B., and Strange, J. M. (2002). Leading creative people: orchestrating expertise and relationships. *Leadership Quarterly*, Vol.13, No.6: pp.705-750.
- Murata, Y. (2003). Productive diversity, taste heterogeneity, and geographic distribution of economic activities: market vs. non-market interactions. *Journal of Urban Economics*, Vol.53, No.1: pp.126-144.
- Niedomysl, T. (2010). Towards a conceptual framework of place attractiveness: a migration perspective. *Geografiska Annaler: Series B, Human Geography*, Vol.92, No.1: pp.97-109.
- Nonaka, I. and Takeuchi H. (1995). *The knowledge creating company: how japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Parsons, T. (2006). *American society: toward a theory of societal community*. Boulder, CO: Paradigm.
- Polensky, K. S. (eds.) (2007). *The economic geography of innovation*. Cambridge, MA: Cambridge University Press.
- Powdthavee, N. (2008). Putting a price tag on friends, relatives, and neighbours: using surveys of life satisfaction to value social relationships. *Journal of Socio-Economics*, Vol.37, No.4: pp.1459-1480.

- Reich, R. B. (1992). *The work of nations: preparing ourselves for 21st century capitalism*. New York, NY: First Vintage Books.
- Rogerson, R. J. (1999). Quality of life and city competitiveness. *Urban Studies*, Vol.36, No.5-6: p.969-985.
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, Vol.94, No.5: pp.1002-1037.
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, Vol.98, No.5: pp.S71-S102.
- Rudzitis, G.. (1989). Migration, places and non-metropolitan development. *Urban Geography*, Vol.10: pp.396-411.
- Sassen, S. (2001). *The global city: New York, London, Tokyo*. Princeton, NJ: Princeton University Press.
- Saxenian, A. (2001). Silicon Valley's new immigrant entrepreneurs. *Working Paper No.15*. San Diego, Center for Comparative Immigration Studies, University of California.
- Schultz, T. P. (1982). Lifetime education within educational strata in Venezuela: Estimation of a Logistic Model. *Economic Development and Cultural Change*, Vol.30, No.3: pp.559-593.
- Silver, D., Clark, T. N. and Graziul, C. (2011). Scenes, innovation, and urban development. In: Andersson, D. E., A. E. Andersson, and C. Mellander, (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.
- Sjaastad, L. A. (1962). The costs and returns of human migration. *The Journal of Political Economy*, Vol.70, No.5: pp.80-93.
- Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London: W. Strahan and T. Cadell, Reprinted 1937, New York: Morden Library.
- Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, Vol.70, No.1: pp.65-94.
- Svart, L. (1976). Environmental preference migration: a review. *Geographical Review*, Vol.66, No.3: pp.314-330.
- Throsby, D. (2007). Modeling the creative/cultural industries. *Seminar on "new directions in*

- research: substance, method and critique*". January 11-12. Royal Society of Edinburgh, Scotland.
- Thurstone, L. (1927). A law of comparative judgement. *Psychological Review*, Vol.34: pp.273-286.
- Tiebout, C. (1956). A pure theory of local expenditures. *Journal of Political Economy*, Vol.64, No.5: pp.416-425.
- Tornatzky, L. G., Gray, D. O., Tarant, S., and Zimmer, C. (2001). *Who will stay and who will leave? Individual, institutional and state-level predictors of state retention of recent science and engineering graduates*. Raleigh-Durham, NC: Southern Growth Policies Board, Southern Technologies Council.
- Train, K. E. (1986). *Qualitative choice analysis*. Cambridge, MA: MIT Press.
- Train, K. E. (2007). *Discrete choice models with simulation*. New York: Cambridge University Press.
- Train, K. E., McFadden, D. and Ben-Akiva, M. (1987). The demand for local telephone service: a fully discrete model of residential calling patterns and service choice. *Rand Journal of Economics*, Vol.18, No.1: pp.109-123.
- Ullman E. L. (1954). Amenities as a factor in regional growth. *Geographical Review*, Vol.44, No.1: pp.119-132.
- Wilks, S.S. (1938). The large-sample distribution of the likelihood ratio for testing composite hypotheses. *The Annals of Mathematical Statistics*, Vol.9, No.1: pp.60-62.
- Williams, H. (1977). On the formation of travel demand models and economic evaluation measures of user benefits. *Economics and Planning A*, Vol.9, No.3: pp.285-344.
- World Intellectual Property Organization (WIPO) (2003). *Guide on surveying the economic contribution of the copyright-based industries*. Geneva: WIPO.
- Yousefi, M. and Rives, J. (1987). Migration behavior of college graduates: an empirical analysis. *Journal of Behavioral Economics*, Vol.16, No.3: pp.35-49.
- Zweig, D. (1997). To return or not to return: politics vs. economics in China's brain drain. *Studies in Comparative International Development*, Vol.32, No.1: pp.92-125



# **Chap III. Analysis of the Locational Choices of Overseas Chinese Talents**

## **1. Introduction**

China has a large stock of overseas talents. Whether these talents are willing to return is essentially a locational choice on the country level. Relating the influential factors on return decision, studies have predominantly focused on former international migrants who have returned to their home countries (Tutu, 2010). The opinions of returnees are thus largely missing in the extant research, which is not yet sufficient to reach a consensus on the factors that affect the choice to return.

In fact, most empirical studies on the return-intentions of highly skilled migrants have focused on those in the US. Studies on the return intention of highly skilled migrants in other host countries are relatively few (Soon, 2010). There are only a handful of studies outside the US, such as Soon (2010)'s work on the return intentions of foreign students in New Zealand, Li et al.'s (1996) study in the U.K., and Rao's (1979) study in Australia. This situation is the same in studies on the return intentions of migrants originating from China.

Previous studies on overseas Chinese talents were conducted mainly in the US. Migrants originating from mainland China are seldom studied except for those in the US. The situation holds true for various migration topics, including the return-intention. The few studies on the return-intentions of Chinese talents were conducted in mainly the US, such as Zweig and Chen (1995), Zweig (1997), Zweig et al. (2006), Zeithammer and Kellogg (2010). Such a focus in the US is partially due to the fact that it has received the largest number of Chinese talents. Another

reason is that the US has the most comprehensive compilation of micro-level data. The large outflow of Chinese talents during past three decades has ensured a huge stock of overseas Chinese talents, whose return-intention is a research topic that deserves more intensive study. For a comprehensive picture of the return-intention of overseas Chinese talents, empirical studies need to be done in countries other than the US. As the second biggest host country of overseas Chinese talents, Japan is definitely a good place to start with.

This chapter first reviews the trends of Chinese talents going abroad and returning. Then by taking Chinese talents living in Japan as an example, the return-intention of overseas talents is examined. A survey was conducted to collect individual opinions. Data includes the respondents' personal attributes and a comparison of their perceptions of possible factors affecting choices between the host and home country.

This chapter provides a behavioral analysis of locational choices on the country level. A comparison of the results from both the direct evaluation approach and the discrete choice approach is performed. This study contributes to the literature on return-intention by adding an empirical case in a country other than the US. It also allows us to observe the pull effects of a developing country with strong economic dynamics. In this phase of upheaval, the case of China is very interesting with regard to the power of attraction on overseas talents.

In terms of a realistic meaning, this chapter offers a perspective on who are likely to be future *haigui*. The results of this study could generate implications of the home country's policies on attracting talents as well as the host country's policies on retaining talents.

## **2. The recent trends of Chinese talents going abroad and returning**

The phenomenon of the brain drain, which has troubled many developing



countries, also used to be a problem in China (Zweig, 1997). It is difficult to agree on the “brain drain” or “reverse brain drain” argument since there is no consensus regarding how to define the two phenomena quantitatively. Considering the magnitude of tertiary students having graduated from domestic universities in recent years, the phenomenon of the “brain drain” can hardly be said to exist in China now. Moreover, China has seen an increasing number of returned overseas talents, which is declared to be a “reverse brain drain” according to some researchers (Keren et al., 2003; Zeithammer and Kellogg, 2010). However, the reverse brain drain argued is also hard to affirm. The fact should not be overlooked that usually the best and brightest go abroad and their return rate remains low.

The outflow of Chinese students can be dated as early as the late Qing Dynasty. Since then, the outflow of talents has shown different characteristics in different historical periods, such as the number of people, popular destination country, return rate, and so on. This thesis focuses on the period after 1978 when the open door policy was launched, since when the country began to experience major changes in the political and economic environment.

## **2.1. Definition of overseas students and returned students**

The Chinese government has long recognized the importance of overseas talents and has issued various measures to encourage the migration of returnees since the 1990s. Preferential policies or incentive programs were designed to attract them back to China. Nonetheless, the country did not see a radical increase of return migration until 2000. Bail and Shen (2008) argued that the acceleration after 2000 can be better explained by the dynamism of China’s market as well as the stagnation of Western economies, instead of the measures and discourse announced by the Chinese government. However, regardless of the effectiveness of incentives, various policies targeted the overseas Chinese do help to smooth the returning process for potential returnees.

The lack of data has largely restricted this thesis to portraying an accurate picture of the outflow and backflow of Chinese talents. China's Ministry of Education (MOE) has published statistics on overseas students and returned students, which provide a way to portray an approximate picture. It should be noted that "overseas talents" should include "overseas students" as well as other Chinese talents who are not students. The reality is that there are no published data on the whole overseas talents; therefore, the statistics on overseas students are an optional way to see the whole picture of the migration of highly skilled Chinese. In fact, the outflow history of Chinese talents is quite similar to the history of Chinese students overseas, because until the late 1980s, the major approach to go abroad has been through higher study. Historically, the mainstream of highly skilled Chinese talents is composed of those initially going abroad to study. It is not until the last two decades did other routes, such as work or investment migration, become optional for the general public.

The Ministry of Education (MOE) of China has long been in charge of monitoring the movements of Chinese students. Official statistics published by MOE only count overseas students (namely *liuxue renyuan*, 留学人员). Preferential policies implemented by other departments always target the same group. A notice about the favorable treatment of the luggage of returning students (namely *liuxue huiguo renyuan*, 留学回国人员) was announced by the Customs General Administration of China (CGA), which defines overseas students as those who have gone to foreign universities, colleges or research institutes, for the purpose of study, training, or academic exchange, and have stayed abroad for at least six months. People going abroad for an initial purpose other than the above are not included. For example, trainees in foreign companies or students in language schools (pre-college students) are not included as preferential subjects.

Correspondingly, the definition of returned students follows the same categorization. Returned students are those who are qualified as overseas students

and have come back to China. The group of these returnees, for whom various preferential policies were designed, is usually referred to as *haigui* (海归) in Chinese. This designation appeared at the end of the 1990s, first on the internet, and then spreading in everyday use. The word is an abbreviation of *haiwai guiguo liuxuesheng* (海外归国留学生, i.e., student returnees from overseas). It is also a homonym for “sea turtle” (海龟), which made the word more popular. They are supposed to obtain a Certification for the Returned Overseas Student, which can be used as a proof in order to enjoy various privileges in the home country. The certificate can be issued to overseas students who stayed abroad for at least six months (for some host countries, the necessary period is one year). However, in some cases, returnees need to have more than one year of overseas study to enjoy privileged treatment, such as applying for research funds provided by MOE to returned students or the tax-free purchase of cars. Thus, this thesis adopts the time limit of **one year** for the definition of both overseas students and returned students.

Please note that these two concepts do not include those who are educated in China and go abroad to non-research institutes. However, for a country to measure its lost rate or return rate of “brains”, educational level is more important than where the person obtained his or her education. Besides, qualified high-level overseas talents, who are currently the Chinese government’s main interest, are not limited to those who were educated abroad. What really matters is their current skill level or knowledge level instead of foreign diploma, although there were times when earlier generation of overseas talents can only get job opportunities in the host countries by graduating from universities in the same country. In order to focus on a more precise group of research objects, this thesis proposes to define this group as overseas talents, which indicates those who hold tertiary degrees and then went abroad (either for study, research, or work) for at least one year. Correspondingly, *haigui* are defined as those who can be counted as overseas talents who have returned to China. In other words, the word *haigui* indicate people who meet three requirements: (i) with tertiary degree

or above; (2) with at least one year experience abroad for study, research or work; (iii) have returned to China now.

## **2.2. Data adjustment**

The existing data on overseas and returned students is far from complete. Different sources have offered contradictory data, and there are data missing for some years. Besides these apparent flaws, there are also problems in the statistical methods. The published data have long underestimated the real numbers of overseas students. To improve the statistical method, several times of adjustments have been conducted, but without publishing the details. Also, usually, no information was provided to adjust data in prior years which were obtained under old statistical methods. As a result, inconsistency has been caused in the data among different years. Based on the available data, the following process of adjustment is conducted.

### **Adjustment of data on overseas students**

Several points in the China Statistical Yearbook (CSY) data of overseas students are worth noting. First, until the end of the 1990s, the data mainly reflected the situation of students sponsored by government or their working units to go abroad and largely underestimates self-supporting students, the number of which increased in the late 1980s. However, due to their small number, self-supporting students studying abroad were overlooked in the statistics prior to 1990. In the 1990s, with the expansion of channels of foreign communication as well as economic development and personal income growth in China, the number of self-supporting students going abroad grew rapidly year-by-year. CSY starts to include them, but they are still a much smaller group than the actual number that researchers are concerned with (Dai, 2012).

At that time, Chinese residents who wished study abroad had to go through procedures such as freezing registered residence status (*hukou* in Chinese), applying for a passport, and reporting their purposes or reasons for going abroad at the local

Public Security Bureau (PSB). Those who intended to study abroad were required to show the admission documents of foreign universities. Thus, their statistics were monitored and recorded by local PSBs. However, those who obtained a passport may not have actually gone abroad, so the figure is considered larger than the number of students actually studying abroad. Using the records of the Ministry of Public Security (MPS) of China (the number of people who obtain private passports), by subtracting people who went abroad for education below the tertiary level (e.g., elementary school, middle school, or language school) and those whose visa application was denied, Zhang and Li (2002) tried to approximate the actual data on students studying abroad from 1978 to 1998 (see Table 01).

However, Zhang and Li's (2002) estimation still proved smaller than the actual number. Combining evidence from multiple sources, such as the MOE website, the Exhibition of Chinese Returnees' Entrepreneurship Achievements held at Beijing in 2004, and Chen (2003), the cumulative statistics of students studying abroad from 1978 to 1996 was reported 269,000 (See Table 3). This is the earliest cumulative data (from 1978) that could be obtained, and multiple information sources confirm that number.<sup>9</sup> However, according to Zhang and Li's (2002) estimation, the number of cumulative students going abroad between 1978 and 1996 amount to 255,060, which is 13,940 less than 269,000. Thus, MOE's data showing 269,000 was adopted to modify the data on years prior to 1996. The number 13,940 allocated from 1978 to 1996 is according to the previous number estimated by Zhang and Li. The formula used for estimation is as follows:

$$Y_t = Y'_t + (269000 - \sum_t^T Y'_t) * \frac{Y'_t}{\sum_t^T Y'_t} \quad \text{with} \quad T = \{1978, 1979, \dots, 1996\},$$

(1)

where  $Y_t$  is the net number of Chinese overseas students on year  $t$ ;  $Y'_t$  is the net

<sup>9</sup> Although Chen says 269 thousand and the other two indicate 270 thousand, it is considered here that the two numbers are not conflicting and the latter one is rounded up from the former one. In this article, the number 269 thousand was adopted.

number of net flow of Chinese overseas students on year  $t$ , which equals the sum of government-supported students (GSS), work-unit supported students (WUSS) and self-supporting students (SSS).

The method of counting passports became invalid since China start to relax the requirements of passport application in 2002. With the accession into the World Trade Organization at the end of 2001, China became more integrated into the world market, which was followed by dramatically growing needs of Chinese people to go abroad. That is when MPS implemented a trial period of issuing private passports more flexibly in Shanghai, Hangzhou, and Guangdong. The biggest change in the new management system is that a Chinese citizen is allowed to apply for a passport according to his or her own wish. Specifically, the applicant needs to provide only his or her ID card and household register, and no longer needs to show documents proving the purpose of going abroad (such as letter of admission to foreign university). This policy was fully implemented in most media and big cities in China in 2005 and is gradually expanding to the rest of the country. Under the new management system, the statistics on students going abroad are much more biased than the statistics on passport applications. Thus CSY's information source has switched to those of the MOE. These synthesized statistics are reported by the Ministry of Education of China, embassies (consulates), embarkation card monitored by Exit and Entry Management Bureau and MPS, data from departments of education and personnel in China's key provinces (municipalities), service centers relating to study abroad, main universities ,and relevant institutions at home country and abroad.

In spite of the improvement in information sources, they are still considered biased. Missing in the statistics are those who went abroad with visas other than for study (for example, work visa, family union visa, etc.) but attended institutions of higher education after they arrived (Wang, 2007). Please note that the criterion of overseas

students is irrelevant with regard to a person's current nationality.<sup>10</sup> Those who changed their nationality later were included as overseas Chinese (former) students in the statistics of MOE.

When measuring in the criterion for overseas Chinese talents (not students), domestically educated migrants should be included, specifically those who went abroad with visas other than for study and not for further education abroad. Their departure is an even bigger loss of human capital for the mother country than students educated overseas, since higher education is subsidized by the country. However, because there are limits to entering the labor market in most developed countries, migrants following this route were not very common. Thus, overseas students still account for the majority of overseas talents. Using the statistics of overseas students, a general trend of outflow of the country's talents could be approximated (Table 2).

#### **Adjustment of the data on returned students**

In this study, adjustment of the data on returned students is conducted to address the inconsistency in the data published by MOE. First, according to the number of returned students published by MOE in individual years, the aggregate from 1978 to 1996 is 72,773 (Table 2). The accumulative number officially published is 89,000 until 1996 according to multiple sources (Table 3). Since 1996 is the earliest year that can be traced, it is used as the base for adjustment. The difference between 72,773 and 89,000, i.e., 16,227 returned students, is estimated for distribution in different years by using the following formula:

$$R_t = R'_t + (89000 - \sum_t^T R'_t) * \frac{R'_t}{\sum_t^T R'_t}, \text{ with } T = \{1978, 1979, \dots, 1996\}, \quad (2)$$

where  $R_t$  is the net number of returned students in the year  $t$ , and  $R'_t$  is the net flow of returned students in the year  $t$ , adopting Zhang and Li's estimation (2002), except

---

<sup>10</sup> It is the same as the definition of "overseas Chinese talents".

for 1979 and 1981 in which case CSY's number is larger than the former.

Regarding returned students, MOE's statistics rely mainly on the data reported by the education offices of Chinese embassies or consulates. According to Wang's (2007) investigation, these offices collected data by counting the overseas students who came to register their arrival and departure or to obtain certification documents. Some events also provided indirect evidence for collecting such information. However, as the market mechanisms implemented in the job market as well as the study abroad market in China, people have a free choice of whether to go abroad, and also no longer rely on the allocation system to find a job. When a large flow of self-supporting students went abroad with no obligation to report their whereabouts, some returned to China without notifying the embassies or consulates. Therefore, like the situation of data on overseas students, the statistics on returned students are also considered largely underestimated (Dai, 2012).

Also, the underestimation problem that existed in the statistics on overseas talents exists in the present study, in the way that *haigui* without educational background abroad are not included. Necessary information is lacking here to adjustment this underestimation. However, at least the existing data is consistent and comparable among different years. We can use these data to determine the return rate of Chinese overseas students, which can be considered an approximation of the return rate of Chinese overseas talents (Table 2).

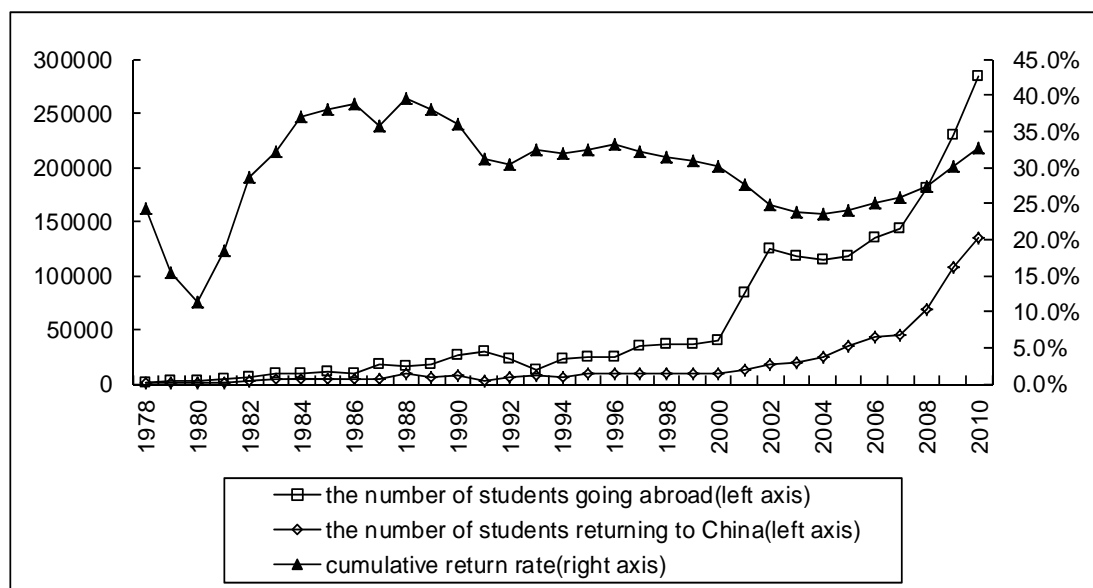
### **2.3. The trend of Chinese students going abroad and returning**

As shown in the previous section, data have been adjusted (for contradictory data) and estimations (of the missing data) have been done to approach the general trend of outflow and backflow of Chinese overseas students. The overall return rate remained under one third until 2010 and was even lower in particular countries. For example, in the US—the most successful country in retaining foreign talents—the actual return rate of Chinese students was much lower. According to Finn (2010), the



return rates of Chinese science and engineering (S&E) PhDs was less than 10%. A return rate of 10% was reported for the class of 1995 (5 years after graduation) and 8% for the class of 2006 (2 years after graduation). Even if the return rate of China has grown slowly in the past decade, the number of students going abroad is increasing even faster, leading to the loss of more talents (Figure 2).

**Figure 2. Return rate from 1978 to 2010**



Source: adjusted by the author based on data from MOE, China.

**Table 2. Numbers of students studying abroad and returned**

Year	Number of students studying abroad							Number of returned students				Number of students staying abroad	Return rate
	CSY	Zhang& Li(2002) <sup>(1)</sup>	Type of financial source <sup>(2)</sup>			My estimation <sup>(3)</sup>	Accumulated	CSY	Zhang& Li(2002) <sup>(3)</sup>	My estimation <sup>(4)</sup>	Accumulated		
			GSS	WUS S	SSS								
1978	860	1187	860		327	1252	1252	248	248	303	303	949	24.2%
1979	1777	2415	1750		665	2547	3799	231	200	283	586	3213	15.4%
1980	2124	2931	2124		807	3091	6890	162	162	198	784	6106	11.4%
1981	2922	4714	3416		1298	4972	11862	1143	1090	1398	2182	9680	18.4%
1982	2326	6129	4441		1688	6464	18326	2116	2500	3057	5239	13087	28.6%
1983	2633	8154	5909		2245	8600	26926	2303	2800	3424	8663	18263	32.2%
1984	3073	8092	5500		2592	8534	35460	2290	3684	4505	13168	22292	37.1%
1985	4888	9843	4888		4955	10381	45841	1424	3497	4277	17445	28396	38.1%
1986	4676	9546	4676		4870	10068	55909	1388	3409	4169	21614	34295	38.7%
1987	4703	11989	4703	6569	6023	18240	74149	1605	3941	4820	26434	47715	35.6%
1988	3786	14496	3786	3535	7175	15288	89437	3000	7367	9010	35444	53993	39.6%
1989	3329	16605	2987	5390	8228	17513	106950	1753	4188	5122	40566	66384	37.9%
1990	2950	24656	2980	5500	17009	26882	133832	1593	6063	7415	47981	85851	35.9%
1991	2900	28156	2495		25661	29695	163527	2069	2536	3101	51082	112445	31.2%
1992	6540	21087	2574		18513	22239	185766	3611	4426	5413	56495	129271	30.4%
1993	10742	11924	2166	951	9167	12576	198342	5128	6286	7688	64183	134159	32.4%
1994	19071	21169	1962	453	18754	22326	220668	4230	5184	6340	70523	150145	32.0%
1995	20381	22623	1616		21007	23859	244527	5750	7054	8627	79150	165377	32.4%
1996	20905	23205	1905	5400	15960	24473	269000	6570	8054	9850	89000	180000	33.1%
1997	22410	35079	2110	5580	27389	35079	304079	7130	8740	8740	97740	206339	32.1%
1998	17622	36000	2639	3540	29821	36000	340079	7379	9046	9046	106786	233293	31.4%
1999	23749	37000	2400	3600	30000	37000	377079	7748	9526	9526	116312	260767	30.8%
2000	38989		2730	3900	32359	38989	416079	9121		9121	125433	290646	30.1%
2001	83973		3360	4200	76413	83973	500079	12243		12243	137676	362403	27.5%
2002	125179		3750	5000	116429	125179	625079	17945		17945	155621	469458	24.9%
2003	117307		3002	5144	109161	117307	742425	20152		20152	175773	566652	23.7%
2004	114682		3524	6858	104300	114682	857088	24726		24726	200499	656589	23.4%
2005	118515		3979	8078	106458	118515	975645	34987		34987	235486	740159	24.1%
2006	134000		5580	7542	120878	134000	1109467	42400		42400	277886	831581	25.0%
2007	144000		8853	6957	128190	144000	1253977	44000		44500	322386	931591	25.7%
2008	179800		11400	6800	161600	179800	1433777	69300		69300	391686	1042091	27.3%
2009	229300		12000	7200	210100	229300	1663077	108000		108300	499986	1163091	30.1%
2010	284700					284700	1947777	134800		134800	634786	1312991	32.6%

Note (0): The abbreviations in the table are used as follows: CSY-China Statistical Yearbook;  
 GSS – government sponsored student; WUSS – work-unit sponsored student; SSS –  
 Self-supported student

Note (1):in the data from Zhang and Li (2002), the numbers in years from 1978 to 1998 are  
 aggregated number of different financial-source students. 1999 is the estimated one.

Note (2): Source of the data of the three sub-groups are as follows: 1978~1999 are from  
 Zhang and Li (2002), except the GSS and WUSS number in 1987 and 1990 which are  
 updated according to the news (<http://library.crtvu.edu.cn/sfw/ReadNews.asp?NewsID=2418>)<sup>11</sup>. Data for the years after 2000 are from MOE website.

Note (3): Source: 1978~1996: Author's estimation are conducted by equation(1). 1997~1999,  
 Zhang and Li (2002). 2000~2010, MOE website.

Note (4): Source: 1978~1996: Author's estimation are conducted by equation(2). 1997~1999,  
 Zhang and Li (2002). 2000~2010, MOE website. 231, 1143.

**Table 3. Accumulated number of Chinese students going abroad and returned**

Year(1978~)	going abroad	returned
1996	26.9 <sup>(1)</sup>	8.9
1997	29.6	9.6
1998	30.2	9.9
1999	32	11.2
2000	34	13
2001	46	13.5
2002	58.5	15.3
2003	70	17.8
2004	81.4	19.8
2005	93.34	23.29
2006	106.72	27.52
2007	121.17	31.97
2008	139.15	38.91
2009	162.07	49.74

<sup>11</sup> According to Zhang and Li (2002), the GSS and WUSS, respectively, are 2485 and 3481 in 1987; 2244 and 5403 in 1990.

Note (1): Some documents show there are 270 thousands students going abroad from 1978 to 1996. It is reasonable to believe it is rounded up from 269 thousands.

Source: 1996 (Chen, 2003); 1997~2002 collected from MOE's publication, news from Xinhua.net, and People's Daily Overseas Edition by Wang (2007); 2003~ traceable on the MOE website.

### **3. Variables and Data**

#### **3.1. Variables**

There are usually two ways to start uncovering the factors affecting the decision to return. Researchers can investigate either those who have returned or those who are still abroad. Extant studies have predominantly focused on the first type (Tutu, 2010), but in this approach, information about those who do not want to return is not included, resulting in selecting biased samples. The other approach is also not perfect, since the intention might not be the same as the final decision. However, generally, the intention is closely related to the final decision and is worth taking into account. Previous studies on return-intention have not been sufficient to reach a consensus on what affects a migrant's inclination to return.

Regarding the mechanism of migration, Lee (1966) developed a "push-pull" model of potential migrants. This mechanism was widely accepted in subsequent research. Discussions on detailed push/pull factors are often exhaustive and subject to the researcher's preference. The migration decision of each individual was made according to judgments of utility. A person is supposed to choose the place that can maximize his or her utility. Each push or pull factor is a reason to change one's utility. Attempts have been made to exclude arbitrary factors and the following aspects are

adopted for our study of Chinese talents in Japan.

### **3.1.1. Career-related factors**

#### **(1) Expected income**

Among the various factors affecting an individual's utility, the economic consideration is emphasized in neo-classical theories and recognized as the dominant reason for migration. Early research on migration implicitly assumed that utility maximization is achieved through the maximization of return to one's human capital, which is usually measured in income. Sjaastad (1962) first made the connection between migration and the return of human capital. He argued that a prospective migrant calculates the value of the opportunity available in the market at the origin, subtracts the costs of moving (assumed proportional to migration distance), and chooses the destination that maximizes the present value of lifetime earnings. His theory became a basic framework for later neoclassical economic analyses of migration. Higher salaries offered in the host country proved to decrease the return intention of those from countries like Turkey (Gungor and Tansel, 2008) and China (Zweig, 1997).

However, return migration has been frequently observed in developing countries where the income levels are still significantly lower than the former host countries. This phenomenon cannot be completely explained by neo-classical theory. Zhang's (2003) study argued that overseas Chinese talents tend to be willing to return when the income difference is less than three times. Zeithammer and Kellogg (2010) suggested that the return rate of highly skilled Chinese migrants in the US will increase about three fold if the salary gap is narrowed to half the current level. These studies suggest that absolute income level is not the only determinant of an individual's intention to return. Other factors affect the utility of a migrant.

#### **(2) Work environment**

Highly educated talents are characterized by a strong desire to realize personal value by utilizing knowledge and potential (Zweig, 1997). This desire is always

expressed as trying to become a pioneer in one's own field by chasing knowledge on the leading edge, as well as a platform for implementing their knowledge. This is a main reason (besides income) for the large flow of highly skilled migrants to developed countries. The modern world system theory, which was developed by Wallerstein (1974) and has won a lot of support in interpreting world patterns, helps to understand international patterns of highly educated migrants. Developed countries like the US, the UK, and Japan are at the global economic core, and developing countries are at the periphery. This system involves not only economic power but also higher education, academia, and the technological world. Developed countries hold leading positions in these areas and provide attractive work environments for talents, allowing them to work more effectively and efficiently.

The quality of the work environment includes aspects of both "hardware" and "software". Good "hardware" means adequate physical resources, such as access to modern equipment, necessary references and databases, and so on. With regard to "software", a good work environment requires the inclusion of high quality peers, an open atmosphere that encourages the exchange of views among colleagues, contact with international experts, adequate financial resources, fair competition, and so on. The work environment in China used to be considered very poor, which prevented the return of many overseas talents (Zweig, 1997). The situation is much improved although there is still much to do. The respondents to the questionnaire were asked to evaluate the work environment in a comprehensive way by comparing China and Japan.

### **3) Career advancement prospects**

The mere presence of a good work environment will not satisfy the need for talents to realize personal value. They also look for better opportunities and bigger platforms to fulfill their potential, which includes prospects for career advancement. For employees who serve a research institute or a company, the prospect of career advancement means promotion opportunities. Being entrusted with a higher position

offers more opportunities, better salary, greater responsibility, and a sense of greater success. However, in reality foreign talents are quite likely to be confronted with invisible barriers to promotion. Ethnic groups often sense a “glass ceiling” (Iredale et al., 2003). Overseas Chinese have frequently complained that they would not be given the same promotion opportunities that their local colleagues enjoyed (Xi, 2002). The frustration derived from the glass ceiling would give rise to the idea of returning to the home country. In other words, the perception of better opportunities in the home country motivates the intention to return. This was proved among foreign tertiary students in New Zealand (Soon, 2010). Chen and Yan (2000) and Iredale et al. (2003) confirmed the home country’s attraction of providing more promising career advancement opportunities for Chinese returnee talents.

In the case of self-employed talents, they look for opportunities to start or expand a business. Given robust economic growth and various incentive policies, entrepreneurial opportunities are becoming more and more attractive in China, especially for those who have necessary social connections (Saxenian, 2001), experience in venture capital markets (Wang and Zweig, 2009), and/or access to marketable technology (Zweig et al., 2006). For talents with start-up ambition, going back to China might be a better way to develop a career.

In either case, career advancement prospects act as a pull factor to the home country. This thesis attempts to determine how this factor affects the intention to return.

#### **4) Social capital**

Social capital is a very important factor in achieving success in a career (Saxenian, 2001). Places where individuals have social connections, such as cities where one was born, attended college, and worked are resources of social capital, which are favorable to career success. In previous studies, the “social connection” index was frequently used to test whether the place where one has always lived affects locational choice. However, even if the results were positive, researchers would have problems in interpretation because there is more than one type of utility that can be derived from

the social connection, and social capital is just one possible explanation. Another important interpretation is the emotional need satisfied by one's old social connections. Individuals feel more comfortable in a familiar social environment, and they might need to be close to people with whom they have emotional attachments, such as family members, relatives, friends, and so on. However, previous research seldom distinguished between social capital and emotional needs. To avoid the interpretation problem, this paper attempted to separate the effects of social capital from emotional needs by designating both of them as variables. Variables that describe emotional needs are discussed in subsection 3.3.1.

### **3.1.2. Living environment**

Career-related factors involve a talent as a producer, whose migration decision is to maximize the returns (pecuniary or psychological) of his or her investment in human capital. The other identity of a talent - a consumer - also affects utility. In addition to the higher income and better job opportunities available in a developed country, a better living environment is also perceived attractive to talents from developing countries. This factor has been overlooked in prior research on international migration, but it is taken into account in research on domestic migration and has been proved related to migration decisions. This thesis attempts to determine whether living environment influences overseas Chinese talents.

The factors relating to living environment are divided into two aspects. The first represents the quality of a country's air, water, green spaces, and so on, that is, the natural environment. The second aspect involves sociopolitical factors, such as the public service and social welfare system, which affects the country's ability to provide education, health care, housing, and the ability to ensure a decent life for the disadvantaged people (such as the unemployed, the ill or disabled, the elderly, and families with dependent children, etc.).

Presumably, compared with Japan, the living environment in China is assumed to be less attractive thus negatively affects the intentions of overseas Chinese talents to



return. This assumption is tested in section 4.

### **3.1.3. Social factors**

#### **1) The emotional need to be close to parents, spouse, friends, and relatives**

Prior studies have argued that people would settle for lower income<sup>12</sup> in the mother country even factoring out the issue of cheaper consumption<sup>13</sup> because pecuniary loss can be compensated by emotional gains, such as being close to one's friends/relatives (Powdthavee, 2008). For most people, foreign society means an unfamiliar, sometimes even hostile environment, which costs them extra energy to adapt to. On the other hand, people get along more easily with people who speak the same language and have the same social norms and cultural conventions as those in their home country, thus avoiding the integration problem. Being close to familiar people could be an emotional comfort for individuals.

As mentioned above, in this research, the effects of social connections between individuals and places are decomposed into social capital and emotional needs. Further decomposition was done to divide emotional needs into three types: with parents, with a spouse, and with friends and relatives. Based on intimacy level, these emotional needs should have different effects, if any, on one's return-intention.

Prior research has shown that parental issues matter because of the filial obligation to comply with parents' wishes to return home. This obligation is particularly strong among first-born sons (Zweig and Chen, 1995; Salaff and Greve, 2009). Other social connections are seldom mentioned in extant literature. Is the proximity to parents the strongest reason for one's intention to return? Do other social connection factors matter? This thesis attempts to answer these questions.

#### **2) Children's education**

We already know that a migration decision is not based on the individual. Usually,

---

<sup>12</sup> The income need to be higher than a physiological minimum threshold (Reichlova, 2005).

<sup>13</sup> Consumption might be cheaper in the home country. The gap between purchasing power in home and host country might not be as huge as income gap. But consumption price differences are becoming smaller across countries. In a world under accelerating globalizing and internationalizing process, the consumer goods are spreading worldwide, with almost the same prices for cars, electronic appliances; even daily commodities like clothes, and shoes etc.

migrants think about utility for a family unit. By including family members like parents and a spouse, we already included the consideration of family as a decision unit. Other family members - children - might also be very important in an individual's decision about residential location. The questionnaire asks the respondents where they would like their children to attend school. Keren et al. (2003) found that Chinese couples in the US tend to choose to stay abroad because they are concerned about transferring their children to Chinese school system that is featured by extremely fierce competition. According to Keren et al., this concern appeared to be so prevalent that, even among *haigui* talents, one spouse commonly returns alone while the rest of the family remains abroad. Meanwhile, the home country's charm of traditional culture is on the other side of this dilemma. Some overseas talents want their children to know more about Chinese language, culture, and history. The home country offers a perceptibly better environment to absorb this kind of information. This research examined whether the issue of children's education would affect one's intention to return.

### **3) Social status**

Psychologists argue that people's sense of happiness depends on their surroundings. The feeling of being valued and admired by society could provide psychological gains for a *haigui* talent. whereas perceived discrimination abroad might hurt his or her feelings and thus compel the return home. In China's traditional culture, the intellectual is recognized as belonging to a superior class, occupying the highest hierarchical level in society (i.e., scholar, farmer, artisan, and merchant, namely *shinonggongshang*), just below royalty (Chen, 1995; Chen and Yan, 2000). This tradition of respecting intellectuals remains to some extent, if not exactly the same. Moreover, China has offered preferential treatment of *haigui* for the last three decades, and is still putting effort into attracting high-level overseas talents, making *haigui* quite a privileged class. Do overseas talents have higher social status in China? Does this affect their return-intention? This research also seeks to answer these questions.

### **3.1.4. Institutional factors**

In subsections 3.1.1 to 3.1.3, we discussed general factors that may affect the intention to return. The factors listed above are also applicable in empirical research on return migration in other countries. However, China's socialist political system is different from the mainstream international world. Institutional concerns might prevent overseas talents from coming back.

Chen (1995) pointed out that migration studies relating to countries other than China are always objective, but when China is involved, institutional factors are always brought up. This is especially true for migration studies in the 1990s. In that period, concerns about political instability in China and the disappointing democratic situation were considered main reasons for Chinese students to choose to stay in the US (Orleans, 1988; Zhang, 1992; Zweig, 1997). After two decades, in the current international context, China is still frequently confronted with criticism about its undemocratic political system. Highly educated talents are usually more sensitive and concerned about the country's democratic process than less-educated nationals. Overseas talents, who experience a different political system, are more susceptible to Western ideology and more likely to have doubts about China's political system. This might be the reason for the low rate of intention to return and the choice of talents to stay abroad. To test this hypothesis, an indicator of a democratic political system is included in the survey to detect its influence on the decisions of overseas talents.

China's fertility policy is also unique among the contemporary nations. This national policy restricts one family to give birth to only one child. Hence, those who want to have more than one child would prefer to stay abroad. Thus, hypothetically, it will lower the return-intention, which is reflected by a negative coefficient. The expected sign for each variable's coefficient is summarized in column 7 of Table 6.

## **3.2. Data**

Data used in this research were collected through a questionnaire survey conducted

in February and March, 2011. The author selected one of China's top universities, Peking University (PKU) and selected its alumni members residing in Japan as survey respondents<sup>14</sup>. PKU graduates who are now living in Japan and registered in the alumni association were invited to participate in the survey. The questionnaire was online and the address was distributed via email. Additional invitations made by telephone were conducted to increase the response rate. Among 179 survey subjects we have contacted (who fit the definition of overseas Chinese talents<sup>15</sup>), 73 responded with valid answers, resulting in a response rate of 47.8%.

The result shows that only a very small proportion (10.9%) of talents have a clear plan to stay abroad, while most (61.6%) plan to go back to China, and the rest (27.4%) have not decided yet. The rate of people with intention to return is much higher than the actual return rate (32.9%) of talents who went abroad from 1978 to 2010.

**Table 4. Choices of return intention**

optional choices	obs	percent
will return to China immediately after graduation (in the case of students)	20	27.4%
will return to China after working in Japan for a period	25	34.2%
not decided yet	20	27.4%
intend to reside in Japan permanently	2	2.7%
intend to go to a third country	6	8.2%

Source: survey data collected by the author

The main variables and summary statistics are listed in Table 5 and Table 6 as follows:

<sup>14</sup> The author is grateful for the support from PKU's alumni association (PKUAA) in Japan during the survey.

<sup>15</sup> The numbers of alumni members whose birthplace is not China were deducted

Table 5. Variable List

variables	description	value
<b>Demographic variables</b>		
<i>male</i>	gender	male=1; female=0.
<i>married</i>	marital status	married=1; unmarried=0
<i>degree</i>	indicates the education level of our subject	Bachelor degree=1; Master degree=2; in Doctor courses or courses finished=3; doctor degree=4
<i>ln age</i>	logarithm of age	
<b>Foreign-life related variables</b>		
<i>income</i>	current income level	<2 million JPY=1; 2~4 million JPY =2; 4~6 million JPY =3; 6~8 million JPY =4; 8~10 million JPY =5
<i>timeabroad</i>	time period have been abroad.	less than 1 year=1; 1 to 3 years=2; 4 to 10 years=3; 11 to 15 years=4; 16 to 20 years=5
<i>wantpr</i>	whether want to obtain Japanese citizenship or the right of permanent residence	yes=1; no=0
<i>japanese</i>	language level of Japanese	entry level=1; enough for daily use=2; mature in business Japanese (English) =3; professional level=4
<i>english</i>	language level of English	
<i>integration</i>	the proportion of social contacts with non-Chinese friends in leisure time	almost all friends are Chinese=1 most friends are Chinese=2; Chinese and foreign friends are about half and half =3; most friends are non-Chinese=4;
<b>variables of comparison perception between home country and host country</b>		
<i>expwage</i>	expected wage	much better in Japan=1; better in Japan=2; about the same=3; better in China=4; much better in China=5.
<i>worken</i>	work environment	
<i>careerpros</i>	career development prospects	
<i>careernet</i>	social network beneficial to career	
<i>naturalen</i>	natural environment	
<i>pubser</i>	public service and social welfare system	
<i>proxparent</i>	proximity to parents	
<i>proxspouse</i>	proximity to (potential) spouse	
<i>soconnect</i>	social connection outside of job and family	
<i>childeddu</i>	children's education	
<i>status</i>	social status	
<i>politicsys</i>	political system	
<i>fertilitypol</i>	fertility policy (one-child policy)	

**Table 6. Summary Statistics**

Variable	Obs	Mean	Std.Dev.	Min	Max	Expected Result
<i>male</i>	73	0.63	0.49	0	1	?
<i>married</i>	73	0.29	0.46	0	1	?
<i>degree</i>	73	2.37	0.81	1	4	?
<i>age</i>	73	28.30	4.53	23	52	?
<i>ln_age</i>	73	3.33	0.14	3.14	3.95	?
<i>income</i>	73	1.79	1.14	1	5	?
<i>timeabroad</i>	73	2.22	0.89	1	5	?
<i>wantpr</i>	73	0.32	0.47	0	1	-
<i>Japanese</i>	73	2.38	0.98	1	4	?
<i>English</i>	73	2.53	0.67	1	4	?
<i>integration</i>	73	2.44	0.88	1	4	-
<i>expwage</i>	73	1.58	0.74	1	4	-
<i>worken</i>	73	1.99	0.86	1	4	-
<i>careerpros</i>	73	3.63	1.09	1	5	+
<i>careernet</i>	73	3.74	1.18	1	5	+
<i>naturalen</i>	73	1.52	0.77	1	4	-
<i>pubser</i>	73	1.47	0.67	1	3	-
<i>proxparent</i>	73	4.59	0.81	1	5	+
<i>proxspouse</i>	73	3.56	1.21	1	5	?
<i>soconnect</i>	73	4.03	0.94	1	5	+
<i>childeddu</i>	73	3.45	1.09	1	5	?
<i>status</i>	73	3.11	1.11	1	5	+
<i>politicsys</i>	73	2.18	0.98	1	5	-
<i>fertilitypol</i>	73	1.96	0.95	1	5	-

## **4. Results and Discussion**

### **4.1. Analysis using the direct evaluation approach**

#### **4.1.1. Summary of the comparison perceptions**

In the traditional push-pull model of international migration, the power is directed one way, that is, pull factors are from the destination country and push factors from the sending country. This framework has influenced most related studies, and detailed pull and push factors were discussed in empirical researches on specific countries ((Bodvarsson and Berg, 2009, Fig 1.1, p.7)). In our discussion of return intention, both powers emanate from the home country, which means the pull (attraction) factors represent factors that attract overseas talents back to the home country, and push (repulsion) factors represent those that make them hesitate to return.

This section evaluates the factors of return-intention using two methods. Sub-section 4.1 adopts a direct evaluation method, by which the respondents are asked to state specifically the most important factors that affect their decisions. Then, section 4.2 presents a comprehensive analysis of the possible factors by using the discrete choice model.

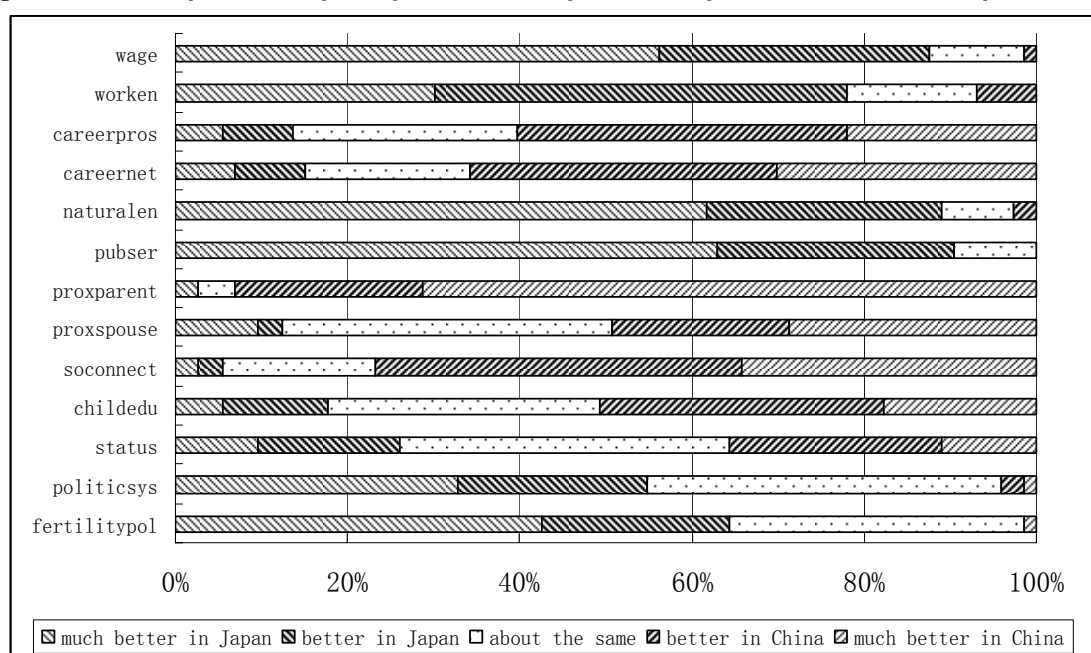
In the survey, the respondents were asked to compare each factor between Japan and China. The results are summarized in Figure 3.

When asked to compare the two countries, the overwhelming majority respondents agreed that Japan provides a better “expected wage”, “work environment”, “natural environment”, and “public service and social welfare system” than China. Furthermore, over half of respondents tended to think that the “political system” and “fertility system” in Japan is ideal, and most of the rest thought that there is not much difference.

On the other hand, China appears to have obvious advantages over Japan in other

issues, such as “career advancement prospects”, “social capital resources”, “social connection with friends/relatives” as well as overwhelming superiority on the “proximity to parents”. Moreover, about half of respondents considered that China provides better “proximity to spouse”, and “children’s education” than Japan. Most of the rest thought that there is not much difference between the two countries. Lastly, regarding “social status”, China has a slight but not obvious advantage over Japan.

**Figure 3. The respondents’ perceptions of comparative aspects of China and Japan**



Source: survey data collected by the author.

#### 4.1.2. Stated push and pull factors

Each individual weighted the factors differently. The survey questions were designed to ask the respondents to state explicitly their opinion on push/pull factors and rank the top three push/pull factors in order of importance. Using the ranked data, a method of ordinary measurement was used to measure the weight, which indicates the relative importance of the factors.

Suppose factor  $i$  ranked  $x$ th on the individual  $n$ 's list; then the frequency  $k$  ranked  $i$  on  $j$  is  $F_{ij}^n = 1$ , if  $x=j$ ; otherwise  $F_{ij}^n = 0$ , then the total frequency factor  $i$  was listed on  $j$  is



$$f_{ij} = \frac{\sum_{n=1}^N F_{ij}^n}{N}, \text{ where } i = 1, 2, \dots, K \text{ and } j = 1, 2, 3; n = 1, 2, \dots, N. K \text{ represents the total}$$

number of factors and  $N$  is the total number of individuals who participated in ranking.

The weight of factor  $i$  can then be obtained by the following formula:

$$w_i = \sum_{j=1}^3 f_{ij} \times (K + 1 - j), i = 1, 2, \dots, K$$

The relative weights of factors were calculated first on the push effect and then on the pull effect. The results are summarized in Table 7.

**Table 7. Result of top three push/pull factors and final scores**

	push effect				pull effect			
	1st <sup>(1)</sup>	2nd	3rd	relative weight	1st	2nd	3rd	relative weight
expwage	22	13	10	<b>7.7</b>	1	—	1	<i>0.3</i>
worken	12	5	10	<i>4.6</i>	1	1	2	<i>0.7</i>
careerpros	1	4	2	<i>1.2</i>	20	10	4	<b>5.9</b>
careernet	1	1	1	<i>0.5</i>	4	9	13	<i>4.3</i>
naturalen	15	21	7	<b>7.3</b>	1	1	3	<i>0.8</i>
pubser	11	19	17	<b>7.9</b>	—	1	—	<i>0.2</i>
proxparent	—	—	—	<i>0</i>	33	13	12	<b>10.0</b>
proxspouse	2	—	—	<i>0.4</i>	8	9	3	<i>3.4</i>
soconnect	—	—	—	<i>0</i>	2	19	20	<b>6.8</b>
childededu	—	—	2	<i>0.3</i>	—	2	5	<i>1.2</i>
status	2	4	3	<i>1.5</i>	3	4	4	<i>1.8</i>
politicsys	4	4	10	<i>3.0</i>	—	1	—	<i>0.2</i>
fertilitypol	2	—	8	<i>1.7</i>	—	—	2	<i>0.3</i>

Source: survey data collected by the author

Note: the number in the column of “1st” represents the number of individuals who list the factor as the most important factor. It is the same for “2nd” and “3rd”.

Table 7 shows that China’s biggest push factor is the “public service and social welfare system”, followed by the expected wage gap between the host country Japan and the “natural environment”. Factors like “work environment”, “political system”,

“fertility policy” also keep overseas talents from returning.

On the other hand, “proximity to parents”, “career prospects”, and “social connection with relatives and friends” are three biggest attractions of the home country. “Proximity to spouse” and “social capital resources” are also perceived by many respondents as pull factors. “Children’s education” and “social status” were also pull factors, but they were seldom listed among the top 3 factors.

The results show that one factor has different effects on different people. Contrary opinions were detected about most factors listed in the questionnaire. It is logical that responses to the factors would depend on the differing circumstances of individuals. The only exemptions are two social-related factors, “the proximity to parents” and “social connection with relatives and friends”, which were recognized as pull factors by all respondents. They are the first and the third most highly scored pull factors. No respondents considered it is important to be in Japan to get close to parents, friends and relatives.

Besides “the proximity to parents” and “social connection with relatives and friends”, the remaining three social-related factors were all perceived in favor of China. Proximity to spouse was an important issue for people as a family consideration. Based on humanitarian considerations, most countries allow visas for family reunions, which means spouse is generally allowed to accompany the migrant. Despite this fact, some respondents listed “proximity to spouse” as one of the top three pull factors of China. This suggests that one’s (potential) spouse might not be willing to migrate, which might result in the respondent’s compromised decision - to return.

Generally, children’s education is not a main concern in migration. Not many respondents listed this factor among the top three. Responses favored the home country slightly, but the advantage is not obvious.

Social status also gives a slight advantage to China, at a higher rating than “children’s education”. Contrary to our assumption, the psychological utility gained from comparably higher social status in the home country was found not to be a strong

incentive for overseas Chinese to return. It might be because newly returned talents can no longer enjoy the superior advantages given to their predecessors who returned to China several years ago. Except a few experts in certain fields, general *haigui* are now treated fairly as the native educated talents. Along with the development of higher education in China, the accumulation of human capital is growing fast. In the labor market, employers have become more rational with regard to hiring an employee with overseas experience. Thus, the social status attached to returnees is fading and is no longer interpreted as a strong pull factor.

Regarding work-related factors, career advancement prospects had the second highest positive weight, which means that it is the second most important attraction of the home country. Social capital was also perceived as a pull factor, whereas expected wage and work environment were more likely to be push factors. Thanks to rapid economic growth and social connections at home, better advancement prospects were perceived by overseas talents, but the wage gap still exists and plays a negative role in decisions to return. Regarding work environment, we can expect China to catch up with developed countries soon under the strong financial influence of the government, but the “software” aspect will take more time and effort before a fundamental change will be seen. As suggested by Miyagiwa (1991), an individual is more productive if he works in close proximity with highly qualified peers. Developed countries would still be more attractive as long as they hold a technological and academic advantage.

Both factors relating to living environment received high scores as push factors and have the second highest negative weight. The factors “natural environment”, “public service and social welfare system”, which are seldom mentioned in policies to attract talent, were the most important push factors, preceded only by “expected wage”. China still has a long way to go to improve the physical environment as well as the social service system.

Institutional factors also appeared in some lists of the top three pull/push factors. The weight of the two institutional factors are negative but the absolute number is less

than that of other push factors relating to work and living environments.

## **4.2. Analysis using the discrete choice approach**

As Figure 3 and Table 7 show, a factor does not necessarily affect individuals in the same way. One factor could be a pull factor for someone but a push factor for another. Although Figure 3 shows how overseas talents evaluate Japan and China on various factors, but the determinant factor affecting the final decisions of overseas Chinese talents is not evident. Hence, the discrete choice model was used to analyze the effect of each factor on the intention to return.

### **4.2.1. Binary logit model**

A widely accepted approach to model individual decisions - discrete choice model (DCM) is frequently used in the analysis of return intention. DCM includes binary logit (Li, et al, 1996; Soon, 2008), ordered probit (Gungor and Tansel, 2008), and multinomial logit models (Zweig, 1997; Soon, 2009). The DCM is derived from random utility theory, according to which an individual is capable of evaluating the utility associated with a set of alternatives and subsequently selecting the alternative that he or she perceives will yield maximum utility (Manski, 1977). Because of the limited number of observations, other approaches were passed over and the binary logit model is adopted here.

An individual labeled  $n$  who faces  $J$  choices ( $J = 2$  in this case, including “return” = 1, “otherwise” = 0) can obtain utility by choosing  $j$ :  $U_{nj} = \beta'x_{nj} + \varepsilon_{nj}$ , where  $x$  represents the vector of observable affecting factors,  $\beta$  is the coefficients vector, and the stochastic error  $\varepsilon$  represents the unobserved utility. The probability an individual chooses  $I$  is the probability utility from “return” is higher than from “otherwise”. If we assume  $\varepsilon$  follows the Gumbel independently, identically distribution<sup>16</sup>. The probability is then as follows:

---

<sup>16</sup> This is also known as Type I Extreme Value distribution. Sometimes it is mistakenly called Weibull distribution, from the log of which a Gumbel distribution is obtained.

$$P_{n1} = \frac{e^{\beta'x_{n1}}}{\sum_{j=0,1} e^{\beta'x_{nj}}}$$

Coefficients are estimated using a maximum likelihood method.

#### 4.2.2. Regression results and discussions

Regarding the choice variable, “return”(value = 1) is used to indicate choices of “will return to China immediately” and “will return to China after working in Japan for a period”, while “0” represents the choice of “will not return” (including “intend to reside in Japan permanently” and “intend to go to a third country”) and “undecided”. Variables were divided into three groups to apply logit analysis. Current income level was also introduced into the first and third regression (spec1 and spec2 in Table 5) as the control variable. The results are listed in Table 8.

**Table 8. Logit regression results**

Group of variables	Variable	Spec1		Spec2		Spec3	
		Coef	p	Coef	p	Coef	p
<i>Demographic variables</i>	<i>male</i>	0.9583	0.110				
	<i>married</i>	0.3448	0.381				
	<i>degree</i>	0.9903	0.232				
	<i>ln_age</i>	-6.1744	0.054				
<i>Foreign-life related variables</i>	<i>income</i>	-0.6176	0.048	-0.7550	0.009	-1.094	0.023
	<i>timeabroad</i>			0.5603	0.193		
	<i>wantpr</i>			-1.489	0.035		
	<i>japanese</i>			0.1211	0.735		
	<i>english</i>			0.0171	0.970		
	<i>integration</i>			-1.3060	0.002		
<i>Variables of comparison perceptions</i>	<i>expwage</i>					-0.7028	0.230
	<i>status</i>					0.2087	0.647
	<i>worken</i>					0.1047	0.855
	<i>careerpros</i>					0.2032	0.643
	<i>careernet</i>					-0.5681	0.215
	<i>naturalen</i>					1.3107	0.190
	<i>pubser</i>					-1.2052	0.194
	<i>proxparent</i>					-1.0663	0.107
	<i>proxspouse</i>					1.2841	0.009
	<i>childeddu</i>					0.7522	0.139
	<i>soconnect</i>					1.6922	0.020
	<i>politicsys</i>					-0.4080	0.530
	<i>fertilitypol</i>					1.0769	0.121
	R squared	0.19		0.2861		0.5176	

**1) Current income matters, not future development**

First, we examine how income affects the intention to return.

Income is found related to one's return-intention. However, a significant result is found only for current income, not future income. The current income level (in Japan) is found negatively related to choice of residence country. Those with higher incomes in Japan are less likely to return to China, due to the larger opportunity cost in Japan if they return.

Apparently, most talents would bear an immediate income loss if they return; this is

already anticipated. The hypothesis tested here is whether future gain will compensate for immediate loss. In a robust economy such as China's, we assume that economic development is very fast and individual gain can be quite promising. Is it because of the expectation of higher future gain that people intend to return? Of course, future gain is not only measured in pecuniary terms. Non-pecuniary gains such as prospects of career advancement also contribute to favoring the home country. However, this hypothesis is not supported by our results. Future income in China is perceived lower than in Japan, so returning means an income loss even in the long term. There is no clear evidence that compensation by career advancement prospects and social capital resources would increase the intention to return. Furthermore, no significant results were found to prove that the worse work environment in China is lowering people's return intention. These results together show that the loss in income is neither covered by the future income nor compensated by other expectations of work. It appeared that the intention to return is not significantly influenced by the dynamics of China's emerging economy.

## **2) Social connections matters as emotional attachments to spouse and friends/relatives (not the parents)**

If economic dynamics do not attract the return of overseas talents, then what are other explanations? The answer resides in social connections. However, it is worth noting that social connections attract talents because of their emotional needs, not social capital. This can be interpreted to indicate that people also accumulate social capital in the host country, so a beneficial social connection is not necessarily limited to the home country. However, an emotional attachment to the home country is much more difficult to replace. Specifically, two types of connections – “with spouse”, “with friends and relatives” were found to be positively significant. It is out of expectation that the “proximity to parents” was not found significantly related. Most of the talents left their parents in China, and the majority of the respondents agreed that China is much better for proximity to parents. It is also frequently listed as one of

the top three factors pulling them back to China. However, the regression results indicate that the final decision to return is not decided by this factor. Although people feel a strong need to be close to their parents, they may unconsciously sacrifice this need and give priority to other factors during the actual decision process.

However, the other two variables of social connections “with spouse” and “with friends and relatives” were found to be positively related. If an individual assigns higher credits to China on the variable of proximity to friends and relatives, there is a high probability he or she might choose to return. After all, life abroad costs extra energy to communicate smoothly with foreigners. However, when individuals do integrate into the host society, they are much more likely to stay. The positively related variable “integration” also provides evidence for this argument. This research uses the proportion of non-Chinese friends in one’s leisure time (self-reported) to represent one’s integration to the host society. If an individual’s friends are mostly Chinese, he or she may have a lower emotional attachment to the host country. With regard to the proximity to spouse, those who left their spouse behind at home may perceive a greater necessity to return home. Unmarried individuals might have two occasions: they might have boyfriend or girlfriend but left them behind in the home country; they might be single and find that it is easier or better to find Mr. or Ms. Right back in China. In either case, the desire to be close to their (potential) spouse increases an individual’s return-intention.

Contrary to our assumption in subsection 3.1, living environment, children’s education, social status, and institutional factors are not decisive factors in the decision to return.

### **3) The influence of age and initial plan**

Personal attributes also have a large influence on the intention to return. The result shows that age is negatively related to the choice of country of residence. The result that “older age, less return intention” is consistent with life circle theory. Our respondents are all in the post-college stage and before the retirement stage in the life



cycle. Since they are all of working age, the older an individual is, the bigger the cost if they return. This will largely reduce their intention to return.

However, those who wish to obtain permanent residence (PR) in Japan or Japanese nationality are found less likely to return. The wish implies an initial plan to return or not. If an individual came to Japan with a plan to return, he or she is more likely to return to China after completing their task (degree, training, work contract, etc.) If an individual has no plan to return initially, he or she is more likely to consider getting a PR status or a nationality, and at the same time has a low intention to return.

Other individual attributes, such as gender, marital status, educational level, along with the language level and the time spent abroad were found not to affect the intention to return.

#### **4.2.3. Comparison between the two approaches**

The results of the logit analysis were different from those of the direct evaluation method. The factors stated as the most important were not found to be significant in decision making. An individual's actual decision to return or not is a complicated process.

Stated preferences might be biased because people tend to exaggerate the effect of things they are bothered with. For example, although an overwhelming majority of the respondents considered that "proximity to parents" a factor in favor of China, the regression results indicate that it does not influence the final decisions. While most people are bothering with parental issues, in their return intention, the need to be proximate to parents is highly likely to be sacrificed.

On the other hand, people tend to underestimate the aspects which they are hesitated to admit. For example, even when they do enjoy a social environment with familiar friends and relatives, they may not like to state it explicitly or even may not have realized its importance. However, this concealed relationship is made clear in the results of behavioral analysis.

The comparison analysis reveals that taking one factor in isolation might produce

different results from taking other relative factors into consideration, which implies a limitation of the direct evaluation method. Although the results are direct and will not lead to wrong implications, respondents are very likely to offer biased answers that might not be the key determinants. There is a high possibility that the really important issues might be overlooked. Thus, it is questionable to what extent the implication is effective. Hence, researchers and policy makers need to be cautious in using the direct evaluation method.

## **5. Concluding Remarks**

### **5.1. Conclusions**

Although China has experienced rapid economic growth, which seems positive for attracting overseas talents to return, the fact is that people do not want to come back because economic prospects are better. Instead, most would be willing to return even with the expectation of economic losses. Even if career advancement prospects are expected to be better in the home country, it is not enough to compensate for economic loss. What would compensate them are the emotional gains of a familiar social environment.

Among various social connections, against the general view, what matters the most is not the need to be close to parents. The reason is that although parents were generally considered very important by all respondents, those unwilling to return would sacrifice it. On the other hand, social interactions with friends and relatives and spouses have a strong influence on the intention to return. Adult individuals build their own social circles. Familiar and integrated social networks will largely determine where they choose to live. If overseas talents had low levels of integration in the host country's society, and if they thought that being close to spouse, friends and relatives in China is very important, they were very likely to show a high intention to return.

We should be aware, however, that this conclusion is based on a small sample of a particular university's graduates residing in Japan. A further investigation on wider samples of overseas talents is desirable.

## **5.2. Implications for the home country**

Precaution should be taken because the rate of return-intention tends to be higher than the actual rate of return. For example, Zweig and Chen (1995) found that 33% of Chinese Science and Engineering (S&E) graduate students in the US intended to return, while Kellogg (2010) found that this number had risen to 45%. However, since the mid-1990s, the actual return rate in the US has been around 10%, according to Finn (2010). Thus, the actual return rate of Chinese talents in Japan might be lower than that of the surveyed rate (61.6%). It is necessary to build a serial database and monitor the respondents' actual decisions to return, similar to the research in the US. However, even at this stage, the study of return intention provides a reference for policies that are effective in attracting talent to return to the home country.

Results showed that the determinant of return intention is primarily social connection, especially the emotional need to be close to (potential) spouses as well as direct social contact with friends and relatives. Familiar social and cultural atmosphere and cultural communication give people psychological satisfaction, which is an inherent advantage of the home country. On the other hand, overseas talents who are better integrated into Japanese society would be less likely to return. China can provide little incentive with regard to social connection; neither does it need to because it naturally is with advantage of social connections with overseas Chinese talents. Thus, Chinese policy should focus on improving the stated push factors, which are the natural environment, public services, and the social welfare system. It should be noted that unlike in the 1990s, the political system is no longer as sensitive an issue for overseas talents. It seems more urgent to change the living environment than to solve ideological differences in the political system.

The regression results also show that people who are older or earn higher incomes tend to be less willing to return. This means that the recent generation of large talent outflow is likely to generate a new returning wave, as a measure of quantity (not the return rate). However, when the home country desires to attract high-level talents that have already achieved success abroad, the task will be tougher.

Prospects of future career advancement are not a decisive factor in the intention to return. This could be good news for other developing countries with less promising economic growth because the utility is not only measured as personal gains from work. However, it is also possible that the country's development prospects needs to pass a certain threshold to dilute its constraining effect.

### **5.3. Implication for the host country**

This research also sheds light on the “brain-retain” policy of the host country. In the case of Japan, in spite of the low return rate of overall overseas Chinese (accumulatively 32.6% until 2010), the rate of our respondents with intention to return is as high as 61.6%. This number is much higher than its main counterpart in the US, where the return intention of Chinese talents<sup>17</sup> was recently reported to be 45% (Kellogg, 2010). If excluding those who want to go to a third country and those who are undecided yet, the proportion of respondents willing to stay in Japan is rather small (merely 2.7%). This is consistent with the Japanese government's conservative attitude towards accepting long-term immigrants unlike its counterparts such as the US, Canada, or Australia (Xi, 2002). However, considering that the survey was taken among former graduates of one of the top universities in China, Japan's international competitiveness in attracting the best talents is worrying. The fact, that Chinese talents are more competent in English than their Japanese (see Table 3), permits them to choose locations across the world. In other words, they do not necessarily stick to Japan, which further challenges Japan's brain-retain policy.

---

<sup>17</sup> The research object of Kellogg (2010) is Chinese S & E graduate students in the US.

If Japan wants to retain Chinese talents, effort could be made to promote the integration of Chinese talents with the Japanese society, by enhancing communication and deepening cultural understanding in order to form emotional ties.

In addition, based on the push and pull factors that were perceived by our respondents, China provides better career development prospects than Japan. If it wants to retain international talent, Japan should eliminate restrictions on and discrimination against foreigners and create a fair working environment.

## References

- Bail, H. L., Shen, W. (2008). The Return of the “brains” to China: what are the social, economic and political impacts? *Asia Visions*, Vol.11.  
Available at: [http://www.ifri.org/?page=contribution-detail&id=5184&id\\_provenance=97](http://www.ifri.org/?page=contribution-detail&id=5184&id_provenance=97)
- BodVarsson, O. B. and Berg, H.V. (2009). *The economics of immigration: theory and policy*. Dordrecht, Heidelberg, London, New York: Springer.
- Chen, Changgui (1995). The survey and analysis on the chinese scholars in US II. *Journal of Higher Education*, No.1: pp.51-65. [Translated from Chinese 陈昌贵(1995).我国留美学界回国意向的调查与分析（下）,高等教育研究, No.1: pp.51-65.]
- Chen, Xuefei (2003). Comments on highly-skilled migration and returns on studying abroad. *China Scholars Abroad*, Vol.161: pp.18-19. [Translated from Chinese 陈学飞(2003).人才流动与留学效益之评说. 神州学人, Vol.161: pp.18-19.]
- Chen, Changgui and Yan, Yueqin (2000). The report of an investigation on Chinese returnee students II: the reason of returning and the role they are playing. *Heilongjiang Researches on Higher Education*, No.2: pp.13-19. [Translated from Chinese 陈昌贵, 阎月勤(2000).我国留学人员回归原因与发挥作用状况的调查报告（二）. 黑龙江高教研究,(2): pp.13-19.]
- Dai, Erbiao (2012). *New immigrants and Chinese economic development: From brain drain to brain circulation*. Tokyo: Taga Shuppan. [Translated from Japanese 戴二彪 (2012 月). 新移民と中国の経済発展——頭脳流出から頭脳循環へ. 東京: 多賀出版.]
- Finn, M. G. (2010). *Stay rates of foreign doctorate recipients from U.S. universities, 2007*. Oak Ridge, TN: Oak Ridge Institute for Science and Education.
- Gungor, N. D. and Tansel, A. (2008). Brain drain from Turkey: an investigation of students' return intentions. *Applied Economics*, Vol.40, No.23: pp.3069-3087.
- Iredale, R., Guo, F. and Rozario, S. (eds.) (2003). *Return migration in the Asia Pacific*. Cheltenham UK/Northampton MA: Edward Elgar.
- Keren, L., GUO, Fei. and Ping, H. (2003). China: government policies and emerging trends of reversal of the brain drain. In: Iredale R., Guo, Fei. and Rozario, S. (eds.) *Return migration in the*

*Asia Pacific*. Cheltenham UK/Northampton MA:Edward Elgar.

- Li, F. L.N., Findlay, A. M., Jowett, A. J. and Skelton, R. (1996). Migration to learn and learning to migrate: A study of the experiences and intentions of international student migrants. *International Journal of Population Geography*, Vol.2, No.1: pp.51-67.
- Miyagiwa, Kaz (Aug., 1991). Scale Economies in Education and the Brain Drain Problem. *International Economic Review*, Vol. 32, No. 3: pp.743-759.
- Orleans, L. A. (1988). *Chinese students in America: policies, issues, and numbers*. Washington DC: National Academies Press.
- Powdthavee, N. (2008). Putting a price tag on friends, relatives, and neighbours: Using surveys of life satisfaction to value social relationships. *Journal of Socio-Economics*, Vol.37, No.4: pp.1459-1480.
- Rao, G. L. (1979). *Brain drain and foreign students*. St. Lucia: University of Queensland Press.
- Reichlová, N. (2005). Can the theory of motivation explain migration decisions?. *Working Papers UK FSV-IES No.97*. Charles University Prague, Faculty of Social Sciences, Institute of Economic Studies, Prague. Available at:  
[http://ies.fsv.cuni.cz/storage/publication/686\\_wp\\_97\\_reichlova.pdf](http://ies.fsv.cuni.cz/storage/publication/686_wp_97_reichlova.pdf)
- Sjaastad, L. A. (1962). The costs and returns of human migration. *The Journal of Political Economy*, Vol.70, No.5: pp.80-93.
- Salaff, J. W. and Greve, A., (March 11-15, 2009). Return migration to Asia: social networks and family relations. Paper presented at *SUNBELT XIX*. San Diego, CA.
- Saxenian, A. (2001). Silicon Valley's New Immigrant Entrepreneurs. *Working Paper No.15*. San Diego, Center for Comparative Immigration Studies, University of California.
- Soon, J. J. (2008). The determinants of international student' return intention. *Economics Discussion Papers*, No.0806, Department of Economics, University of Otago.
- Soon, J. J. (2009). When do students intend to return? Determinants of students' return intentions using a multinomial logit model. *Economics Discussion Papers*, No.0906, Department of Economics, University of Otago.
- Soon, J. J. (2010). The determinants of students' return intentions: a partial proportional odds

- model. *Journal of Choice Modelling*, Vol.3, No.2: pp.89-112.
- Tutu, R. (2010). Determinants of the estimation of return migration propensities among young people in the face of risk: Accra, Ghana. *Journal of Applied Sciences*, Vol.10, No.8: pp.620-622.
- Wallerstein, I. (1974). *The modern world-system vol. i: capitalist agriculture and the origins of the European world-economy in the sixteenth century*. New York/London: Academic Press.
- Wang, Huiyao (2007). Contemporary Chinese *haigui*. Beijing: China Development Press.  
[Translated from Chinese 王耀辉(2007).当代中国海归.北京:中国发展出版社].
- Wang, Huiyao and Zweig, D. (2009). China's diaspora and returnees: impact on China's globalization process. *50th International Studies Association Annual Conference*. New York.
- Xi, Cheng (2002). Non-remaining and non-returning: Mainland Chinese students in Japan and Europe since the 1970s. In: Nyiri, P. and Saveliev, I. (eds.) *Globalizing Chinese migration: trends in Europe and Asia*. Burlington, US: Ashgate.
- Zhang, Zaisheng (2003). Study on the Talent Back-floating in China and its Causing Mechanism. *Population Journal*, Vol.6: pp.21-26. [Translated from Chinese 张再生(2003).中国智力回流及其引致机制研究. *人口学刊*, Vol.6: pp.21-26.]
- Zhang, Guochu and Li, Wenjun (2002). The brain drain of Chinese scientific and Technological talent and its impacts. *Quantitative and Technical Economics*, Vol.19, No.1: pp.5-9. [Translated from Chinese 张国初,李文军(2002).中国科技人才外流的规模及其影响. *数量经济技术研究* 院, Vol.19, No.1: pp.5-9.]
- Zeithammer, R. and Kellogg, R. (2010). The hesitant hai-gui: a conjoint analysis of job preferences among U.S.-educated Chinese scientists and engineers. *Working Paper Series* 2010.09.01, Anderson School of Management, University of California, Los Angeles. Available at: [http://www.anderson.ucla.edu/faculty/robert.zeithammer/HesitantHaigui\\_Sep2011.pdf](http://www.anderson.ucla.edu/faculty/robert.zeithammer/HesitantHaigui_Sep2011.pdf)
- Zweig, D. (1997). To return or Not to return: politics vs. economics in China's brain drain. *Studies in Comparative International Development*, Vol.32, No.1: pp.92-125.
- Zweig, D. and Chen, C. (1995). *China's Brain Drain to the United States: Views of Overseas Chinese Students and Scholars in the 1990s* (China Research Monograph Series). Berkeley, CA: Institute for East Asian Studies.



Zweig, D., Chung, S. F. and Vanhonacker, W. (2006). Rewards of technology: explaining China's reverse migration. *Journal of International Migration and Integration*, Vol.7, No.4: pp.449-471.

## Appendix I: appendix tables

**Table 9. The distribution of international students from China, by country of origin**

destination country	percentage(%)	rank
United States	21.6	1
Japan	15.3	2
Australia	11.3	3
United Kingdom	8.9	4
Canada	7.1	5
Korea	6.0	6
Germany	5.0	7
France	4.1	8
New Zealand	2.7	9
Russian Federation	1.8	10

Source: Education at a glance 2010, OECD

**Table 10-1. The results of collinearity diagnosis (1)**

	male	married	degree	ln_age	income	timeabroad	wantpr	japanese	english	integration
male	1.000									
married	-0.077	1.000								
degree	0.282	0.197	1.000							
ln_age	-0.046	0.578	0.217	1.000						
income	-0.039	0.382	-0.157	0.409	1.000					
timeabroad	0.030	0.461	0.215	0.737	0.416	1.000				
wantpr	-0.091	0.155	-0.092	0.396	0.149	0.367	1.000			
japanese	-0.368	0.092	-0.164	0.306	0.220	0.430	0.248	1.000		
english	0.018	-0.056	0.118	-0.107	0.000	0.081	-0.146	0.107	1.000	
integration	-0.362	0.200	0.042	0.354	0.215	0.355	0.199	0.285	0.163	1.000
expwage	0.136	-0.003	0.126	0.187	0.174	0.207	0.071	0.093	0.016	0.034
worken	-0.079	-0.061	-0.173	-0.190	-0.187	-0.215	-0.231	0.056	-0.036	-0.121
careerpros	0.184	-0.035	0.205	-0.132	-0.017	0.129	-0.150	-0.113	0.123	-0.234
careernet	0.169	0.012	-0.014	-0.325	0.022	-0.197	-0.403	-0.177	0.197	-0.356
naturalen	0.151	0.082	0.223	-0.103	-0.194	-0.212	-0.270	-0.233	-0.117	-0.219
pubser	0.067	0.101	0.011	-0.091	-0.018	-0.151	-0.298	-0.064	-0.161	-0.045
proxparent	-0.109	-0.089	-0.061	-0.419	0.057	-0.201	-0.239	-0.009	0.231	-0.055
proxspouse	0.098	-0.221	0.054	-0.332	-0.206	-0.349	-0.439	-0.289	0.122	-0.285
soconnect	0.235	-0.245	0.041	-0.464	-0.072	-0.274	-0.272	-0.282	0.065	-0.433
childedu	0.005	-0.153	0.107	-0.320	0.020	-0.190	-0.337	-0.177	-0.031	-0.280
status	0.127	-0.036	0.202	-0.094	-0.026	0.060	-0.147	0.037	0.088	-0.163
politicsys	0.024	0.071	0.021	-0.264	-0.079	-0.206	-0.337	-0.174	0.086	-0.076
fertilitypol	0.027	-0.101	0.002	-0.318	-0.239	-0.270	-0.408	-0.102	-0.031	-0.111

**Table 10-2. The results of collinearity diagnosis (2)**

	expwage	worken	careerpros	careernet	naturalen	pubser	proxparent	proxspouse	soconnect	childeddu	status	politicsys	fertilitypol
expwage	1.000												
worken	0.078	1.000											
careerpros	0.078	0.069	1.000										
careernet	-0.080	0.024	0.466	1.000									
naturalen	0.150	0.286	0.101	0.045	1.000								
pubser	0.236	0.205	-0.046	0.015	0.470	1.000							
proxparent	-0.178	0.111	0.344	0.437	-0.009	-0.052	1.000						
proxspouse	-0.086	0.101	0.033	0.269	0.189	0.067	0.251	1.000					
soconnect	-0.221	-0.034	0.363	0.469	-0.001	-0.153	0.323	0.217	1.000				
childeddu	0.103	0.229	0.236	0.222	0.263	0.031	0.321	0.424	0.392	1.000			
status	0.158	0.162	0.448	0.297	-0.019	-0.032	0.281	0.108	0.236	0.370	1.000		
politicsys	0.163	0.069	0.050	0.077	0.394	0.424	0.093	0.184	-0.186	0.223	0.148	1.000	
fertilitypol	0.034	0.255	0.147	0.090	0.374	0.490	0.104	0.346	-0.030	0.192	0.254	0.622	1.000

**Appendix II: Questions and summary results of the questionnaire****Table 11-1. Questions and summary results of the questionnaire**

Questions	Optional answers	Obs (persons)	Percentage
Gender	male	46	63.0%
	female	27	37.0%
Degree	with a PHD degree	7	9.6%
	in PHD courses or completed	21	28.8%
	in master courses or with a master degree	37	50.7%
	with a bachelor or equivalent degree	8	11.0%
marital status	unmarried	52	71.2%
	married	21	28.8%
has been abroad for	16 to 20 years	2	2.7%
	11 to 15 years	3	4.1%
	4 to 10 years	17	23.3%
	1 to 3 years	38	52.1%
	less than 1 year	13	17.8%
has been in Japan for	16 to 20 years	1	1.4%
	11 to 15 years	4	5.5%
	4 to 10 years	15	20.5%
	1 to 3 years	37	50.7%
	less than 1 year	16	21.9%
the visa type when first came to Japan	all kinds of working visa	18	24.7%
	pre-college student visa	1	1.4%
	student visa	44	60.3%
	others	10	13.7%
current visa	non-permanent residence status	69	94.5%
	Japanese nationality	2	2.7%
	right of permanent residence	2	2.7%
	others	0	0.0%
Do you want to obtain Japanese citizenship or the right of permanent residence?	yes	23	31.5%
	no	50	68.5%
level of Japanese language	professional level	11	15.1%
	mature in business English	21	28.8%
	enough for daily use	26	35.6%
	entry level	15	20.5%
level of English language	professional level	6	8.2%
	mature in business English	28	38.4%
	enough for daily use	38	52.1%
	entry level	1	1.4%
annual income(pretax) in 2010	8 to 10 million JPY	3	4.1%
	6 to 8 million JPY	5	6.8%
	4 to 6 million JPY	8	11.0%
	2 to 4 million JPY	15	20.5%
	less than 2 million JPY	42	57.5%

**Table 11-2. Questions and summary results of the questionnaire (continue)**

Questions	Optional answers	Obs (person)	Percentage
current occupation	researcher in universities or research institutes	7	9.6%
	R&D workers in enterprise	15	20.5%
	administrative worker in enterprise	4	5.5%
	student	42	57.5%
	others	5	6.8%
range of social contacts in leisure time	almost all friends are Chinese	10	13.7%
	most friends are Chinese	30	41.1%
	Chinese and foreign friends are about half and half	24	32.9%
	most friends are foreigners	9	12.3%
majored in which discipline	economics and management	6	8.2%
	art and humanities	6	8.2%
	social studies	18	24.7%
	applied natural sciences	26	35.6%
	natural sciences	17	23.3%
choice of country for future residence	will return to China immediately after graduation (in the case of students)	20	27.4%
	will return to China after working in Japan for a period	25	34.2%
	not decided yet	20	27.4%
	planning to reside in Japan permanently	2	2.7%
	planning to go to a third country	6	8.2%
the occupation wish to take if return to China	start-up entrepreneurs	8	11.0%
	researcher in universities or research institutes	30	41.1%
	R&D workers in enterprise	14	19.2%
	administrative worker in enterprise	6	8.2%
	government civil servants	6	8.2%
	student	1	1.4%
	others	8	11.0%
How do you evaluate current preferential policies for returnee talents?	cannot really work on attracting talents back, and enlarged social injustice meanwhile	4	5.5%
	They have some effect. But it is more important to improve the overall institutional environment, to create a fair playing field.	48	65.8%
	They are an expedient measures, but necessary at present.	7	9.6%
	They show that the country is valuing overseas talent, and can work much on attracting them to contribute to the home country.	14	19.2%

**Table 11-3. Questions and summary results of the questionnaire (continue)**

Questions	Optional answers	Obs (person)	Percentage
Your opinion on preferential policies.	opposite	1	1.4%
	indifferent	16	21.9%
	support	56	76.7%
Do you think the following preferential policies for returnee talents are necessary?		No	YES
		observations	observations
	tax breaks and rent deduction	12	61
	resolving troubles relating hukou, children's education	7	66
	material reward: houses or cars.	37	36
	pecunial reward: award money, research funds, start-up funds	8	65

**Table 12. Question: Please compare China and Japan on the following factors.**

	much better in Japan	better in Japan	about the same	better in China	much better in China
expected wage	41	23	8	1	0
work environment	22	35	11	5	0
career development prospects	4	6	19	28	16
social network beneficial to career	5	6	14	26	22
natural environment	45	20	6	2	0
public service and social welfare	46	20	7	0	0
proximity to parents	2	0	3	16	52
proximity to (potential) spouse	7	2	28	15	21
social connection outside of job	2	2	13	31	25
better for children's education	4	9	23	24	13
social status	7	12	28	18	8
political environment	24	16	30	2	1
childbirth system	31	16	25	0	1

**Table 13. Question: Please list the top 3 important factors that pushing you out of your home country (push effect) and that pull you back to the home country (pull effect)**

ranking	push efect			pull effect		
	1st	2nd	3rd	1st	2nd	3rd
expected wage	22	13	10	1		1
work environment	12	5	10	1	1	2
career development prospects	1	4	2	20	10	4
social network beneficial to career	1	1	1	4	9	13
natural environment	15	21	7	1	1	3
public service and social welfare	11	19	17		1	
proximity to parents				33	13	12
proximity to (potential) spouse	2			8	9	3
social connection outside of job				2	19	20
better for children's education			2		2	5
social status	2	4	3	3	4	4
political environment	4	4	10		1	
childbirth system	2		8			2



## **Chapter IV: The Distribution Pattern of General *Haigui* and Underlying Factors**

### **1. Introduction**

Chapter III reviewed recent trends in the inflow and outflow of Chinese talents and analyzed the locational choices of overseas talents at a country level. This chapter analyzes the choice of a place inside a country. Some might argue that making choice of a province or city might not necessarily be different from selecting a country. For example, one may consider whether to live in London, Tokyo, or Beijing, instead of choosing the US, Japan, or China before he or she chooses a city in that country. However, since institutional differences among various countries are so huge, they cannot be ignored in a direct comparison. It is also extremely difficult to list all the alternatives for all cases in an empirical research. To simplify the analysis, this research assumes that the choice of a province or city is a separate step from the process of choosing a country. The talents' locational choices inside China are assumed to be on a certain spatial scale, which, due to the availability of data, are on the provincial level in the present study.

The distribution of talents not only varies on an international scale but also shows large differences inside a country. The uneven distribution of talented people as an important reason for regional economic differences has provoked the intensive concern of urban managers. However, in China research on explaining the uneven distribution has largely lagged behind. Part of the reason is the imperfect data. Macro data on the migration of talents in China are rough and absent of necessary details, while studies adopting micro data remain undeveloped. Another important reason is

the fact that it is difficult to rule out institutional factors that result from the planned economic management system, the previous job allocation system and the household registration system. Because of the restrictions of registered residence, the free movement of people has not yet been completely realized. Social welfare is largely tied to the registered residence (*hukou*) of people, which places strict limits on mobility. It is especially difficult if one wants to register a residence in major cities like Beijing or Shanghai. Another relevant factor is the old job allocation system, which allocates jobs for university graduates. It was terminated in 1997<sup>18</sup> but until that time the job market was nearly completely closed and there was a lack of mobility. At that time, the distribution of talents was controlled by government planning, making research on the locational choices of talents inapplicable and unnecessary in the Chinese context. After several years in the market system, the job market has shifted largely towards a free market and individuals are allowed to choose or change jobs as they wish.

Consequently, the distribution of talented people became increasingly unbalanced. Coastal provinces gathered growing numbers of talents, whereas inland provinces experienced a dearth of them. To narrow regional differences in economic development, China has inaugurated a series of national projects, such as “developing the west” (西部大开发), “rising of the middle” (中部崛起), and “revitalizing the northeast” (东北复兴). Against this background, research on the locational choices of highly productive people and the factors affecting their uneven distribution is necessary. However, such research is facing challenges from *hukou* system and the remaining influences from former distribution pattern.

This chapter finds a way to reduce these restrictions by focusing on *haigui* talents

---

<sup>18</sup> In 1994, the former State Education Commission (current MOE) issued a document named "Opinions on further reform of recruitment and employment of universities and colleges graduates system," and proposed to change the employment system of college students. The job allocation for graduates would be terminated in 1997 according to the new policy. The work units and schools meet to coordinate supply and demand, and exercise a "two-way choice," wherein work units may select their own employees and graduates may choose their employers.

as the research subject. When returning from other countries, *haigui* talents face the choice of where to reside. Theoretically, they are free to choose anywhere in the country. Although there are restrictions according to *hukou*, their movement is much less restricted than their counterparts without overseas experience. Almost all the major cities have offered preferential treatment (*hukou* included) to *haigui*. Observing *haigui* helps us to study locational choice behavior by ruling out the restrictions of *hukou*.

Until now, very few empirical studies have been done on the distribution of *haigui* in China, largely because of the unavailability of data. Macro data was released in 2004 for the first time and used in an empirical study by Dai (2012). Studies adopting micro data were absent. This chapter begins by estimating the actual distribution of *haigui* and tries a discrete choice analysis using micro data.

After the distribution and locational choices of general *haigui* are examined in this chapter, Chapter V focuses on *haigui* entrepreneurs. By revealing the determinants of their location choice, these two chapters offer empirical examples of locational choices in the developing country, so that a comparison with developed countries can be done.

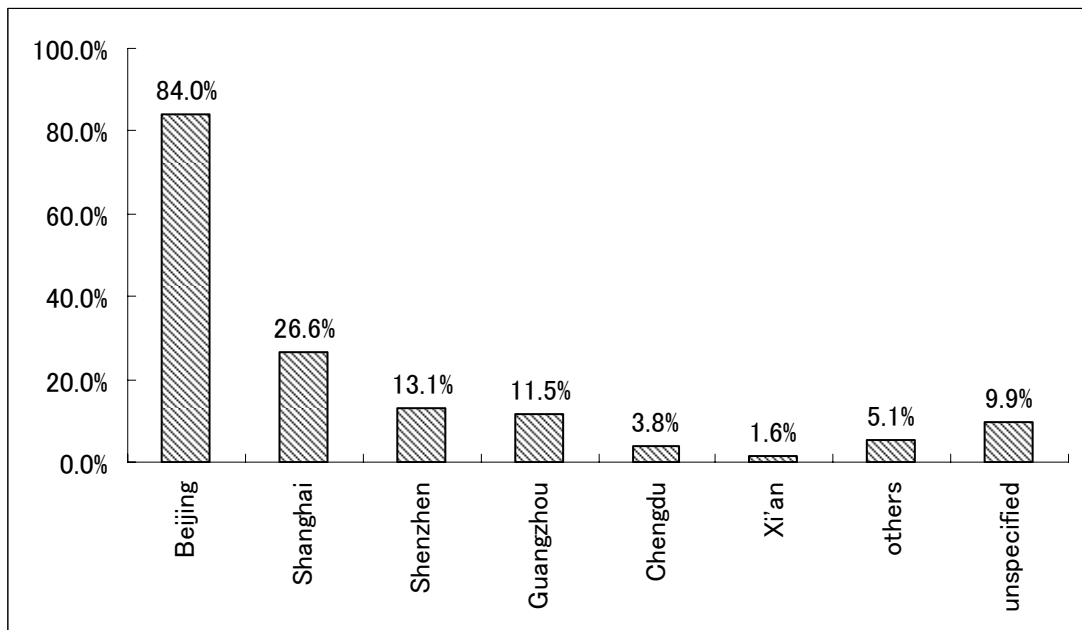
## **2. Distribution of *haigui***

In China, the distribution of *haigui* talents is extremely unbalanced, tending to cluster in a few cities. A telephone sampling survey targeting *haigui* was conducted in 2007 by the Oriental Huibo Institution (the research department of a human resource counseling company). In that survey, 1624 *haigui* talents were interviewed by telephone. Figure 4 shows the favorite cities of the investigated *haigui*. The result shows that there is huge gap in the attractiveness of cities according to the preferences of *haigui* talents. Certain cities are highly preferred over others.

Generally, coastal cities are preferred more than inland ones. Beijing is the most attractive and was chosen by the overwhelming majority of *haigui* (84%) as the favorite return destination. Shanghai ranks second but is 57.4% less than Beijing (merely 26.6%). Other cities, such as Shenzhen, Guangzhou, Chengdu, Xi'an, Qingdao, were also mentioned but by only a small number of respondents.

The investigation revealed that the preferences of Chinese *haigui* are extremely unbalanced with regard to cities in the country. However, such an investigation always has a problem of biased sampling. The randomly selected *haigui* samples might be geographically biased in the first place and therefore might not correctly represent their preference of return destination. The actual distribution of highly-skilled returned Chinese remained unclear and required further discussion.

**Figure 4. Ranking of general *haigui*'s favorite cities as return destination**



Source: Oriental Huibo Institution (2007.07)

Note: multiple choice questions.

Because selection bias compromises the sampling survey, more comprehensive data is required to observe the distribution of *haigui*. The most authoritative statistics

to date are data released on the Exhibition of Chinese Returnees' Entrepreneurship Achievements (Beijing, 2004), which was held by the Propaganda Department of the Communist Party Central Committee of China (PCC), the Ministry of Personnel (MOP), and the Ministry of Education (MOE). This exhibition published provincial data on general *haigui* and *haigui* entrepreneurs for the first time. Although the data on *haigui* entrepreneurs was complete for most provinces (28 out of 31), data on general *haigui* were missing for 16 provinces. Based on data published by the 2004 exhibition and sporadically released by local governments, estimations have been made for the distribution of general *haigui* in 2008. Detailed estimation processes and results are presented in Table 14. Figure 5 displays the same results on a map, which presents the distribution more clearly.

Although the estimation dataset may not be perfectly accurate, it helps to approach the real situation. Because there was no official release of data on *haigui* after 2004, this is the latest and most comprehensive dataset on *haigui* to date. Despite the accuracy problem, this dataset can reflect the real situation to some extent and therefore is useful in indicating the distribution pattern of *haigui*.

**Table 14. The distribution of generate *haigui* in provinces (2008)**

Province	2003			2007	2008	estimated distribution in 2008
	<i>haigui</i>	<i>haigui</i> -start-ups	<i>haigui</i> entrepreneurs	<i>haigui</i>	<i>haigui</i>	
Beijing	40000	2000	5000	70000	80000	80000
Tianjin		129	345			5650***
Hebei	1500	63	69			3075**
Shanxi	3000	26	100		4000	4000
Inner Mongolia	1331	18	26			2729**
Liaoning		269	380		24000	24000
Jilin		143	210			3439***
Heilongjiang		98	146			2391***
Shanghai	50000	1010	4580	68000	75000	75000
Jiangsu		579	976	30000	[1690Wuxi]	33690*
Zhejiang	3000	300	589		[4000Hangzhou]	9646***
Anhui	3000	113	206		4000	4000
Fujian	4000	128	344	[2500Xiamen]	[4000Xiamen]	8200**
Jiangxi		25	31			508***
Shandong	4000	418	448	8000	[1000Qingdao]	8984*
Henan		51	95			1556***
Hubei		161	330			5404***
Hunan	4000	100	157			8200**
Guangdong	10000	526	866	20000		22460*
Guangxi		120	120			1966***
Hainan	300	29	14		387	387
Chongqing		30	40	3000		3369
Sichuan	2600	179	231			5330**
Guizhou						200
Yunnan		59	64			1049***
Tibet						N/A
Shaanxi		296	390			6387***
Gansu	1000	39	54			2050**
Qinghai					200	200
Ningxia		6	11		~200	176
Xinjiang	1800	20	20			3690**
Total						327736

Source: 2003 data is from the Exhibition of Chinese *Haigui*'s Entrepreneurship Achievements

(held at Beijing in 2004, by the PDC, MOP, MOE); data for 2007, 2008 are from Returned Chinese Scholars Pioneer Yearbook (2008, 2009).

Note (1): [n] represents data officially published about major cities of the province.

Note (2): The estimation is based on the following principles. The number in the latest year is of higher priority as an estimation base. Specifically, data in 2008 were first adopted. If data are not available, then the estimation from 2007 is used. In the case of provinces still lacking data, estimations are made based on data from 2003.

(a) The numbers in superscript\* are estimated from the data published in 2007. It is already known that the growth rates of *haigui* in 2008 compared to 2007 are as follows: Beijing = 1.103, Shanghai = 1.143, China (national wide) = 1.123. Then, the average 1.123 is used to calculate.

(b) The numbers in superscript\*\* are estimated from the data published in 2003. It is already known that the growth rates of *haigui* in 2008 compared to 2003 are as follows: average of provinces (with data available in both year) = 1.75, China (national wide) = 2.35. The mean value 2.05 is set as the growth value for the estimation.

(The data on Sichuan province are actually data for Chengdu city.)

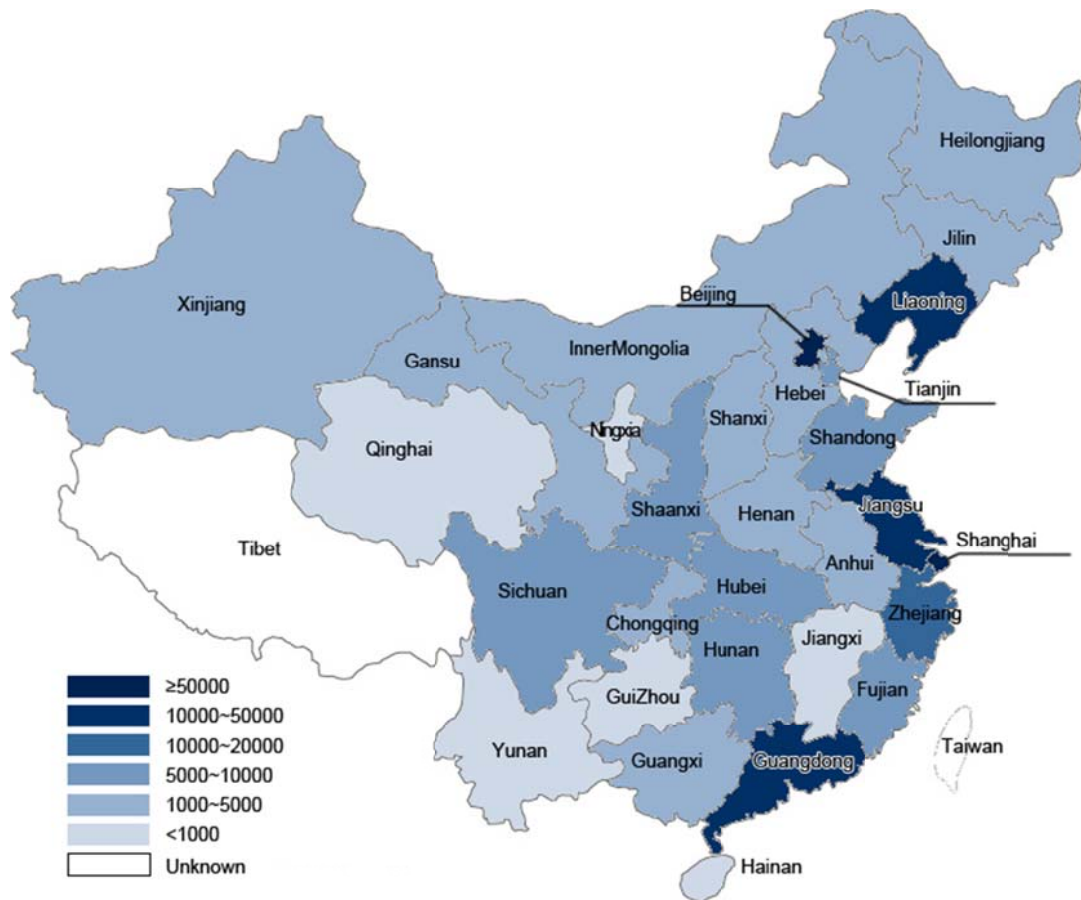
(It is worth noting that the number of Zhejiang's *haigui* talents is 6150 after the two-step calculation, and is too low (especially compared to its neighboring province, Jiangsu). Thus, the result of the third step is adopted for Zhejiang provinces.)

After steps (a) and (b), some provinces lack data. The third step is to estimate the numbers for them according to their proportions to Beijing and Shanghai, by using entrepreneur data from 2003. It was found that these results are usually underestimated, compared to provinces with data that is already known. So the relatively higher number (proportional to Shanghai's data) was adopted to complete the final dataset. The resulting numbers are noted in superscript \*\*\*.

Data on Guizhou is calculated by none of the previous three ways. According to an unofficial data source (<http://www.gyrc.com.cn/news/detail.asp?id=2675>), there are about 200 *haigui* talents in Guizhou, and this number was adopted. Data on Tibet was also

missing after the aforementioned three steps were done. The *haigui001* database does not include *haigui* who currently reside in Tibet, which indicates that Tibet is rarely chosen by *haigui*. Thus, the case database will not contain cases in Tibet, and this province is dropped from the alternative set.

**Figure 5. Distribution of generate *haigui* in provinces (2008)**



Source: Estimated by the author, see Table 14 for detail.

Table 14 and Figure 5 show the following features of the distribution pattern of general *haigui*.

(1) First, coastal provinces have the highest numbers of general *haigui*. General *haigui* tend to gather in economically developed regions.

(2) In the coastal region, Beijing and Shanghai have attracted most general *haigui*



talents, more than any other provinces. The two cities have received about half the general *haigui* (47.3%). Beijing ranks first and Shanghai ranks second in the number of them. However, the difference between these two cities is not as huge as the media commonly asserts—the Oriental Huibo Institution (2007.07), for example (see Figure 4).

(3) Almost all inland provinces show very low number of general *haigui*, especially the western provinces.

In general, huge differences exist between provinces and regions. To measure the extent of these differences in the ability to attract and retain *haigui* talents, ideas can be borrowed from the Gini coefficient, which is used in measuring income differences. Provinces were ranked from low to high according to the number of *haigui*. The cumulative share of provinces was ranked from least to most *haigui* distributed in the Lorenz Curve shown in Figure 6. The Gini coefficient is the area between the Lorenz Curve and the line of equality (45 degrees), which is marked “A” in the diagram. The Gini coefficient can be thought of as the ratio of area A over the area under the line of equality, which is “A + B”, that is,  $G = A/(A + B)$ . Here, the extent of uneven distribution is measured in the same way as the Gini coefficient is calculated, and is defined as the *concentration coefficient*.

Similar to the way Gini coefficient being calculated, the *concentration coefficient* can be obtained using the following formula:

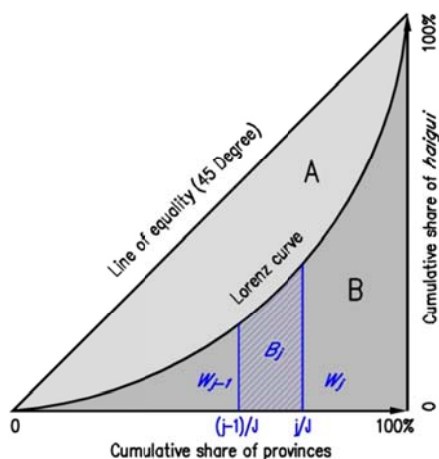
$$\text{ConcentrationCoefficient} = \frac{A}{A+B} = \frac{(A+B)-B}{A+B} = 1 - \frac{B}{A+B} = 1 - \frac{B}{1/2} = 1 - 2B,$$

$$\text{while } B = \sum_{j=1}^J B_j = \sum_{j=1}^J \frac{1}{2} (w_{j-1} + w_j) \times \frac{j - (j-1)}{J}.$$

where,  $j$  represents the province  $j_{\text{th}}$  with least *haigui*, and  $J$  is the total number of provinces;  $w_j$  represents the cumulative share of *haigui* from the least to  $j_{\text{th}}$  least provinces, and  $w_0$  equals 0. This coefficient ranges from 0 to 1. The larger the coefficient, the more concentrated is the distribution *haigui*. This coefficient equals 1

when all *haigui* are gathered in one province, and equals 0 when *haigui* are evenly distributed in all optional provinces.

**Figure 6. Graphical representation of the concentration coefficient**



Note: The ideas are borrowed from the Gini coefficient.

The concentration coefficient of the *haigui* distribution was found to be 0.685, which confirmed a high level of inequality. To determine the reasons for the uneven distribution, the next section performs a statistical analysis.

### 3. Variables and data

The distribution of *haigui* talents is the outcome of their locational choices. In other words, it is the final result of their migration processes. These processes might have included decisions of whether to leave their host country, whether to go back to China, and where to reside in China. This chapter focuses on the last step of choosing a place inside the country, assuming that the other choices have already been made. Thus, the factors affecting the distribution of general *haigui* inside the country are similar to those affecting internal migration.

### **Economic factors**

In labor economics, internal migrants are suppliers of services or, effectively, maximizing investors in human capital (Bodvarsson and Berg, 2009). In this framework, migration is an investment decision, which involves immediate costs and possible profits in the future. All things being equal, a migrant chooses the location that offers the highest net income. The view of migration as investment in human capital was first put forward by Sjaastad (1962). His focus on economic net gains has become the basic framework for nearly all recent neoclassical economic analyses of the internal migration decision. Thus, economic factors are the most basic in a migration model. Most *haigui* talents work as employees and get paid by their employers. Thus, income is considered the most significant economic reason. Other economic indicators, such as employment growth rate or per capital GDP, are also taken into consideration.

### **Amenities**

The other role of a migrant is a consumer of amenities, including public goods (Bodvarsson and Berg, 2009). Greenwood (1997) has pointed out that by the 1980s internal migration models based on the human capital investment model were consistently failing to confirm wages or earnings as determinants of migration. These criticisms gave rise to an alternative view called the “equilibrium” perspective on migration. In contrast to the traditional disequilibrium perspective in which people migrate to take advantage of regional income differences, this equilibrium model takes consumption into account. It is recognized that a person’s utility function includes goods and services that are not identical in every place. People adjust consumption according to not only changes in their income level, but also the cost and availability of goods in certain places. Affected by the consumption issue, people’s utility function will be changed correspondingly if they choose to reside in a different place. Among other consumption issues, the focus has been on the demand for amenities, which tend to be distributed unevenly across the country. The

amenities affect a person's utility of residence and lead to the relocation of migrants. Thus, migration occurs and efficient markets quickly re-equilibrate. Above all other types of amenities, public goods, as argued by Tiebout (1956) in his "vote on feet" hypothesis, are our main research interest. The explanatory variables include medical and educational services, as well as cultural offerings in this chapter. In addition, an indicator of green space is included to test if the natural environment affects people's locational choices.

### **Social ties**

It has been recognized that social ties are an important factor in explaining international return migration. Social connections with the mother country can either offer emotional comfort (Powdthave, 2008; Dahl and Sorensen, 2009) or social capital (Saxenian, 2001; Benson-Rea and Rawlinson, 2003). The results of Chapter III confirmed the effect of social ties as emotional comforts.

Regarding the locational choices inside a country, the effect of social ties is tested in the following analyses. Dummy variables are defined to represent connections with places, such as birthplace, place of study, work place, and so on. Limited by the data, this chapter only considers relationships of *haigui* with birthplace.

### **Creative Milieu**

Recent research has observed that the creative milieu affects the residential choices of talents (Florida, 2008). Talents are supposed to be attracted to a creative milieu, which is characterized by the 3Ts of technology, talent, and tolerance.

Variables of 3T indicators are specified. Technology power is measured in three ways. The first variable, the *innovation* index, describes technological output, which is measured by the number of patents granted per 10,000 people. The second variable, *R&D investment*, is measured by the strength of input in improving technological power, which is measured by the share of R&D investment in the industry output. The third one, *high-tech share*, implies the role of technology in the industrial structure, which is measured by the share of high-tech industry in the total

industrial output.

The second “T”—talent—represents the talent power of province  $j$  and is measured by the share of college educated people over 15 years old.

The most important “T” is tolerance. Because China does not have data on homosexual people as usually used by Western researchers, adjustments have to be made to measure tolerance in Chinese provinces. Three indicators are designed to represent the tolerance of a place: *openness length*, *population diversity*, and the *bohemian* index. *Openness length* is measured by the number of years since the first national zone was established in province  $j$ . China used to be cut off from the outside world and blocked trade with foreign countries for decades. International trade did not restart until 1978. Initially, the national zone was a window to foreign countries. New ideas, including business cultures, can be obtained from these interactions. Thus, it is possible that the earlier a place opened up, the more tolerant it would be. Another indicator, *population diversity*, suggested by Florida et al. (2008), is measured by the share of people without a locally registered residence (*hukou*). The third indicator, the *bohemian* index, is measured by the share of workers in artistic and related industries among the total population. To be specific, workers in the culture, sports, and entertainment industries are included.

**Table 15. Alternative variable list**

Categories	Variables	Description	Sources
Creative Milieu	(Tolerance) Openness length	the time period from when the first national-level development zones up to 2008	CADZ( <a href="http://www.cadz.org.cn/en">www.cadz.org.cn/en</a> )
	(Tolerance) Population diversity	the percentage of residents without local <i>hukou</i> (registered residence status) among the total population	<i>Statistical Yearbook of China</i> (NBS, 2009)
	(Tolerance) Bohemian index	the share of workers in the sector of Culture, Sports, and Entertainment among the total population	
	(Talent) Talent share	the percentage of people with college or higher level educational background within the population over 15 years old	
	(Technology) Innovation index	the number of patents per 10000 population	<a href="http://www.sipo.gov.cn/">http://www.sipo.gov.cn/</a>
	(Technology) R&D investment	the percentage of R&D investment in the industry output (%)	<i>China Statistical Yearbook on High Technology Industry</i> (NBS, various year)
	(Technology) High-tech index	the share of high tech industry output in the total industry output (100%)	
Economic factors	Wage	the logarithm of average wage level (RMB)	<i>Statistical Yearbook of China</i> (NBS, 2009)
	Economic dynamics	average employment growth rate during the past 3 years	
	Economic level	the logarithm of per capital GDP (CNY)	
Amenities	Culture offerings(art)	the number of art performance troupes per million population	
	Medical services	the logarithm of the number of doctors per 10000 population	
	Education services	the logarithm of the number of teachers in Middle and Elementary Schools per 10000 population	
	Education services quality	the number of teachers in Middle and Elementary Schools per 100 students	
	Green space	the share of green covered area of constructed urban area	
Population size	Population size	the logarithm of the number of population (10 thousand)	<i>China Statistical Yearbook on High Technology Industry</i> (NBS, various year)

## 4. Results and discussion

### 4.1. Discrete choice analysis

Discrete choice analysis was conducted first. A total of 1908 cases were drawn from the registration information of a social network website (<http://www.haigui001.com>). The number of cases is proportional to the actual number of *haigui* in each province. Personal attributes, such as age, gender, marital status, birthplace, currently city of resident and the country of study are available for analysis. *Haigui* are assumed to have chosen the current residence as their final decision.

The *haigui* samples have the following features:

- 48.6% are male, and the rest 51.4% being female;
- 26.7% are married, and the rest 73.3% are unmarried;
- their ages range from 22 to 70, with an average age of 29 (see detail in Table 16);
- 58.9% of the sample *haigui* chose the birthplace.

**Table 16. Ages of the samples**

age	22~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59	60~64	70~74	total
no. of cases	218	1071	445	95	42	24	8	3	1	1	1908
percentage(%)	11.43	56.13	23.32	4.98	2.20	1.26	0.42	0.16	0.05	0.05	100

As shown in the description of the samples, most of the sampled *haigui* are unmarried and in their late 20s. In spite of the fact that the numbers of younger-generation students going abroad has increased greatly as well as the number of subsequent younger *haigui*, there is a high possibility that these samples are biased towards the younger generation. To better represent the *haigui* in general and examine their locational choices, improved sampling methods will be necessary

in future studies.

Nested logit models were adopted to analyze choice behavior but failed to reach any persuasive result. Various nested trees were tried, but it was difficult to meet the requirements of IIA assumption. Even when the IIA property was satisfied in some cases, no significant results were found. To demonstrate, the results of one nested logit tree (see Figure 7) are shown in Table 19 and Table 20.

The failure of the nested logit analysis might be because the place variables were not sufficiently differentiated for individuals. In other words, the individual information about the cases (sampled *haigui*) was not sufficient to enable the nested logit model. With additional information, such as the year of return is available adopted in Chapter V, the model would have worked better. Unfortunately, such information is not available and all people who returned to province  $j$  are treated as having the same optional provinces in 2008. This largely limits the explanation of the effect of alternative variables on individual choice behavior. In future research, further testing will be done when the data is more sufficient.



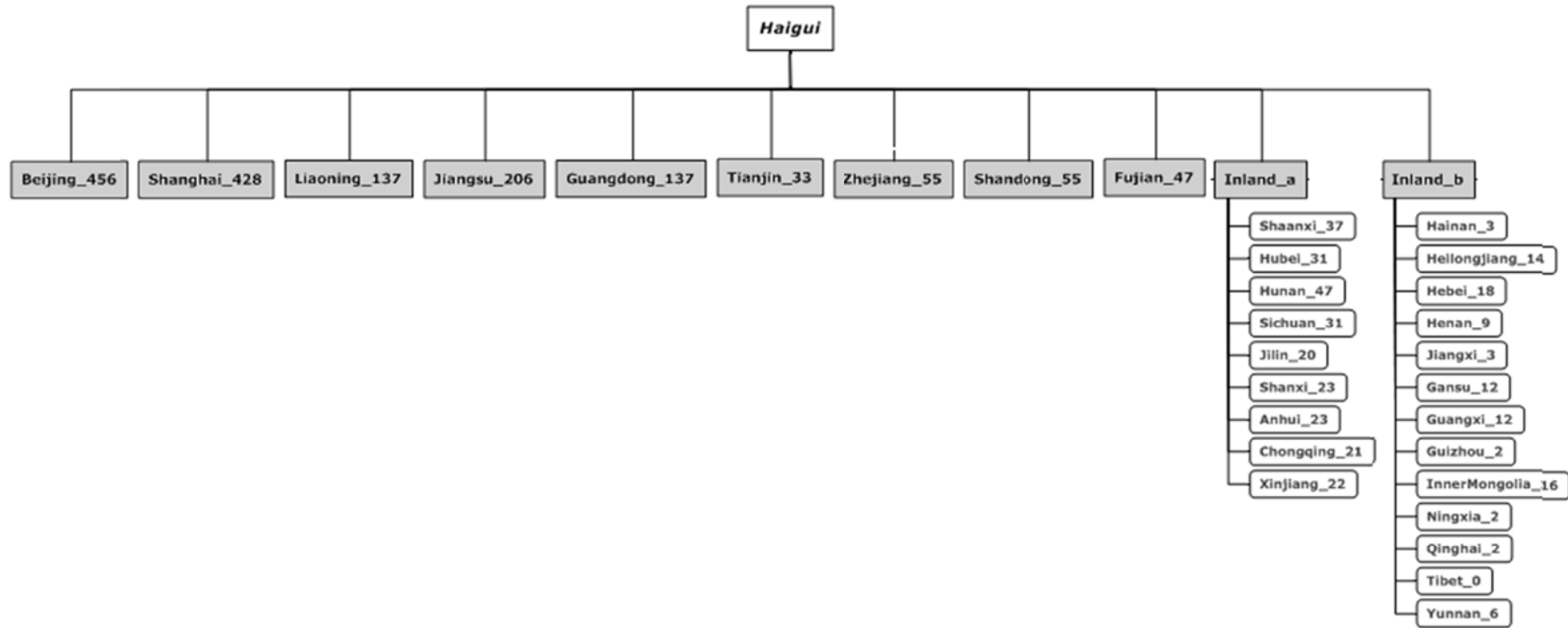
**Table 17. Summary of statistics**

types	variables	Obs	Mean	Std. Dev.	Min	Max
Personal Variables	male	57240	0.4858	0.4998	0	1
	ln_age2011	57240	3.3536	0.1511	3.091	4.2485
	married	55380	0.2665	0.4421	0	1
	ifNA	57090	0.135	0.3418	0	1
	ifASIA	57090	0.1146	0.3185	0	1
	ifAUS	57090	0.1724	0.3777	0	1
	ifEU	57090	0.5759	0.4942	0	1
Observed Variables	(Tolerance) Openness length	57240	17.667	4.6428	7	24
	(Tolerance) Population diversity	57240	0.0916	0.0862	0.0214	0.4061
	(Tolerance) Bohemian index	57240	0.1261	0.1449	0.0501	0.8792
	(Talent) Talent share	57240	0.0886	0.0555	0.0387	0.2980
	(Technology) Innovation index	57240	2.5673	3.3322	0.3984	12.9566
	(Technology) R&D investment	57240	0.0872	0.0862	0.0002	0.3477
	(Technology) High-tech index	57240	0.0755	0.0729	0.0046	0.2836
	<i>Haigui</i> policies	57240	2.1146	0.8359	0.6931	4.4067
	<i>Haigui</i> parks	57240	4.9667	7.2778	0	29
Controlled Variables	Wage	57240	10.21	0.2211	9.8831	10.9135
	Culture offerings(art)	57240	2.719	1.6868	0.6327	7.6090
	Medical services	57240	2.8036	0.2607	2.326	3.5508
	Education services	57240	4.4533	0.3044	3.3684	5.3814
	Green space	57240	0.3561	0.0429	0.2588	0.4255
	Population size	57240	8.1461	0.7567	6.3177	9.1637
	Birthplace	57240	0.0319	0.1757	0	1

**Table 18. Collinearity Diagnosis**

	(Tolerance) Openness length	(Tolerance) Population diversity	(Tolerance) Bohemian index	(Talent) Talent share	(Technology) Innovation index	(Technology) R&D investment	(Technology) High-tech index	Haigui policies	Haigui parks	Wage	Culture offerings(art)	Medical services	Education services	Green space	Population size	Birthplace
(Tolerance) Openness length	1.000															
(Tolerance) Population diversity	0.152	1.000														
(Tolerance) Bohemian index	-0.090	0.767	1.000													
(Talent) Talent share	0.046	0.807	0.836	1.000												
(Technology) Innovation index	0.321	0.832	0.538	0.783	1.000											
(Technology) R&D investment	0.170	0.680	0.453	0.568	0.678	1.000										
(Technology) High-tech index	0.348	0.828	0.581	0.707	0.803	0.892	1.000									
Haigui policies	0.602	0.373	0.122	0.178	0.533	0.444	0.490	1.000								
Haigui parks	0.313	0.604	0.572	0.528	0.677	0.491	0.647	0.711	1.000							
Wage	0.157	0.765	0.685	0.812	0.807	0.573	0.698	0.317	0.613	1.000						
Culture offerings(art)	-0.321	0.094	0.057	0.100	-0.021	-0.199	-0.163	-0.340	-0.214	0.126	1.000					
Medical services	0.047	0.642	0.697	0.843	0.636	0.341	0.436	0.217	0.426	0.667	0.221	1.000				
Education services	-0.195	-0.262	-0.183	-0.333	-0.388	-0.390	-0.391	-0.280	-0.282	-0.163	0.412	-0.272	1.000			
Green space	0.226	0.295	0.064	0.154	0.325	0.355	0.379	0.537	0.415	0.054	0.022	0.057	-0.091	1.000		
Population size	0.489	-0.164	-0.336	-0.379	-0.033	0.123	0.043	0.525	0.192	-0.342	-0.459	-0.381	-0.183	0.280	1.000	
Birthplace	0.080	0.108	0.077	0.109	0.127	0.090	0.117	0.126	0.142	0.094	-0.031	0.096	-0.069	0.083	0.042	1.000

Figure 7. The nested logit tree



**Table 19. Results of nested logit regression (with social connection variable)**

Place variables	Personal variables included													
	Male, Ln_age, Married							If_NorthAmerica, If_Asia, If_Oceania, If_Europe						
Openness length	+							+(*)						
Population diversity		+							+(***)					
Bohemian			-							+(***)				
Talent				-							+(***)			
Innovation index					+(*)							+(***)		
R&D investment						+							+(***)	
High-tech index							+							+(***)
Wage	+(*)							+(***)						
Cultural offerings	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(*)	+(***)	+(***)	+(***)	+	+(***)	+(***)
Medical services						-	-						+(***)	+
Education services	-(*)	-	-	-	-	-	-	-(***)	-	-(***)	-	-	-	+
Green space	-	-(*)	-(*)	-	-(*)	-(**)	-(**)	+	-	-	-	-	-	-(**)
Population size	+	+(*)	+	+	+(*)	+	+	+	+(*)	+(**)	+(***)	+	+	+
Birthplace	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)
IIA assumption satisfied?	no	no	no	no	no	no	no	no	no	no	no	no	no	no

**Table 20. Results of nested logit regression (without social connection variable)**

Place variables	Personal variables included													
	Male, Ln_age, Married							If_NorthAmerica, If_Asia, If_Oceania, If_Europe						
Openness length	?							+(***)						
Population diversity		-							+(***)					
Bohemian			-							+(***)				
Talent				-							+(***)			
Innovation index					+							+(**)		
R&D investment						+							+	
High-tech index							+							+(***)
Wage	?							+(**)						
Cultural offerings	?	-	-	-	+	-	-	-(***)	+(*)	+	+(**)	+(**)	+	+
Medical services						-	-						+(*)	+(***)
Education services	?	+	+	-	+	+	+	-	-(*)	-(**)	-(*)	-(*)	-	-
Green space	?	+	+	+	-	+	+	+(**)	-	-	-	-(*)	-	-(*)
Population size	?	-	-	-	+	-	-	-(*)	+(***)	+(***)	+(***)	+(**)	+(**)	+(***)
Birthplace														
IIA assumption satisfied?		yes	yes	yes	yes	yes	yes	no	no	no	no	no	no	no

## 4.2. Linear regression analysis

Because the discrete choice analysis failed, individual decisions on location choice cannot be observed here. Instead, a linear regression was conducted, using the aggregate data of *haigui* in each province to analyze the factors affecting *haigui* stock.

The linear regression model for the analysis is as follows:

$$\mathbf{Haigui}_j = C + \beta_1 \mathbf{Wage}_j + \beta_2 \mathbf{Technology}_j + \beta_3 \mathbf{Talent}_j + \beta_4 \mathbf{Tolerance}_j + \beta_5 \mathbf{Cultural\_offerings}_j + \beta_6 \mathbf{Medical\_services}_j + \beta_7 \mathbf{Educational\_services}_j + \beta_8 \mathbf{Green\_space}_j + \beta_9 \mathbf{Population}_j + \varepsilon$$

where *Haigui* represents the number of *haigui* stock in province *j*; **Wage** represents the wage level of province *j* and is measured by the logarithm of average wage level; **Technology**, **Talent** and **Tolerance** represents the variables describing the creative milieu. There are three optional variables of technology and tolerance, which will be tested in models. However, each indicator has only one variable that was tested once.

**Cultural\_offerings**, **Medical\_services**, **Education\_services**, and **Green\_space** are about the amenities in province *j*; **Population** size, measured in the logarithm of population, is controlled for in the analysis.

The above variables all use data in year 2008. *C* is the constant and  $\varepsilon$  is the random error.  $\beta_1 \sim \beta_9$  represent the coefficients.

As shown in Table 23, the effects of wages on the concentration of talents are confirmed (see specification 1). However, the collinearity diagnosis shows, wage level is highly correlated to other economic indicators. Besides higher income levels, developed economy, and rapidly growing job market should also affect the stock of talents. These factors, as a package, attract and retain *haigui* talents. Thus, *haigui* talents tend to gather in places with higher income levels, which usually accompany dynamic economic development.

Many non-economic related variables were also found have high collinearity with income level, such as medical services and most creative milieu variables (see Table 22). Almost all 3T indicators have high collinearity with the income level of a place, except the index of openness length. It is hard to separate the effects of creative milieu (or medical services) from those of income level. Perhaps it is appropriate to think that a highly developed economy is always accompanied by these kinds of features. The information on medical services, talent power, technology power, as well as tolerance can be represented by the high economic level. However, the dominant factor should still be considered the economic level (income level included).

In specification 1, no significant relationship was found between the *Tolerance* index, which measures the length of open-up years, and the stock of *haigui*. The 3T factors other than “openness length”, which all have high collinearity with wage level, are tested in specification 2~7. These six models test the remaining 3T factors one by one in models without the correlated wage variable. It is logical to think that economic factors can be decomposed into 3T factors. The results show that the distribution of *haigui* is closely related to the creative milieu. Two indices describing *Tolerance*, one describing *Talent*, and three *Technology* indices were all found to be positively related to the stock of *haigui*. In addition, among the three *Technology* indices, *R&D investment* was not as representative as the other two, because the model with it shows the lowest R squared.

In specifications 8~11, the *Technology*, *Talent*, and *Tolerance* factors were tested in the same model to observe their effects. It was found that *population diversity* and the *bohemian* index, representing the *Tolerance* of a place, were positively related to the numbers of general *haigui*.

*Talent* power is also very closely related to the gathering of general *haigui*. The positive relationship with *Talent* power indicates that general *haigui* are attracted to places where highly educated talents tend to gather. The gathering of talented people

might have a self-enhancement effect on talents regardless of *haigui* or native-educated. On the other hand, the positive relationship means general *haigui* talents show a distribution pattern similar to that of other talents. It is possible that they behave similarly with the native-educated counterparts, but such a conclusion requires further test in future studies. The differences between general *haigui* and native talents, in distribution and locational choice behaviors, have largely reduced as the number of general *haigui* increases.

Unlike the *Talent* power and *Tolerance*, *Technology* power showed only a weak relationship. The weak effects of *Technology* might be because *haigui* dispersed into diversified occupations. Earlier *haigui* may have focused on specific industries requiring high technology. However, nowadays, their choices of occupations have been much more diversified. The increasing numbers of *haigui* also indicate an increasing supply of talents and subsequently fiercer competition. Some will settle in ordinary jobs instead.

There is another finding worth noting. The weak relationship of the stock of *haigui* and *Technology* indices are found in the *innovation* index. Neither of the other two indices representing *R&D investment* and *high-tech share* is found significantly related. The results become more interesting when compared with the analysis results of *haigui* entrepreneurs in Chapter V.

In addition, after controlling for population size, the relationships with amenities and *haigui* stock were found to be not significant in specification 8~11.



**Table 21. Summary statistics of linear regression**

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Haigui</i>	30	10924.530	19654.070	176	80000
(Tolerance) Openness length	30	17.667	4.722	7	24
(Tolerance) Population diversity	30	0.092	0.088	0.021	0.406
(Tolerance) Bohemian index	30	0.126	0.147	0.050	0.879
(Talent) Talent share	30	0.089	0.056	0.039	0.298
(Technology) Innovation index	30	2.567	3.389	0.398	12.957
(Technology) R&D investment	30	0.087	0.088	0.000	0.348
(Technology) High-tech index	30	0.076	0.074	0.005	0.284
Wage	30	10.210	0.225	9.883	10.914
Economic dynamics	30	1.024	0.018	1.005	1.086
Economic level	30	10.039	0.505	9.085	11.200
Culture offerings(art)	30	2.719	1.716	0.633	7.609
Medical services	30	2.804	0.265	2.326	3.551
Education services	30	4.453	0.310	3.368	5.381
Green space	30	0.356	0.044	0.259	0.426
Population size	30	8.146	0.770	6.318	9.164

**Table 22. Collinearity diagnosis**

Variable	(Tolerance) Openness length	(Tolerance) Population diversity	(Tolerance) Bohemian index	(Talent) Talent share	(Technology) Innovation index	(Technology) R&D investment	(Technology) High-tech index	Wage	Economic dynamics	Economic level	Culture offerings(art)	Medical services	Education services	Green space	Population size
(Tolerance) Openness length	1.000														
(Tolerance) Population diversity	0.157	1.000													
(Tolerance) Bohemian index	-0.089	0.764	1.000												
(Talent) Talent share	0.040	0.793	0.832	1.000											
(Technology) Innovation index	0.326	0.834	0.536	0.768	1.000										
(Technology) R&D investment	0.179	0.683	0.448	0.541	0.682	1.000									
(Technology) High-tech index	0.353	0.828	0.575	0.679	0.804	0.896	1.000								
Wage	0.161	0.767	0.684	0.800	0.809	0.576	0.699	1.000							
Economic dynamics	0.323	0.746	0.676	0.669	0.736	0.656	0.781	0.715	1.000						
Economic level	0.432	0.745	0.507	0.751	0.842	0.568	0.709	0.759	0.706	1.000					
Culture offerings(art)	-0.325	0.058	0.049	0.121	-0.052	-0.245	-0.209	0.093	-0.223	0.005	1.000				
Medical services	0.036	0.617	0.687	0.843	0.610	0.303	0.396	0.645	0.503	0.748	0.255	1.000			
Education services	-0.204	-0.274	-0.183	-0.309	-0.399	-0.412	-0.412	-0.175	-0.229	-0.286	0.445	-0.235	1.000		
Green space	0.234	0.306	0.065	0.138	0.335	0.374	0.397	0.066	0.249	0.339	-0.030	0.031	-0.120	1.000	
Population size	0.492	-0.151	-0.332	-0.385	-0.020	0.142	0.063	-0.329	-0.070	-0.068	-0.469	-0.392	-0.201	0.293	1.000

**Table 23. Results of linear regression**

Specification	1	2	3	4	5	6	7	8	9	10	11
Variables	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.
(Tolerance) Openness length	+										
(Tolerance) Population diversity		+(***)								+(**)	+(**)
(Tolerance) Bohemian index			+(***)					+(**)	+(*)		
(Talent) Talent share				+(***)				+(***)	+(*)	+(***)	+(***)
(Technology) Innovation index					+(***)				+(**)		+
(Technology) R&D investment						+(**)					
(Technology) High-tech index							+(***)	+		+	
Wage	+(***)										
Culture offerings(art)	+	+	+	+	+	+	+	+	+	+	+
Medical services						+(***)	+(***)				
Education services	-(**)	-(*)	-(**)	-	-	-	-	-	-	-	-
Green space	+(*)	+	+(*)	+	+	+	+	+	+	+	+
Population size	+	+	+	+(**)	-	+	+	+(**)	+(*)	+(**)	+(**)
C	-(***)	+	+	-(*)	+	-	-	-	-	-	-
R-squared	0.7178	0.8050	0.7232	0.8343	0.7165	0.6564	0.8043	0.8935	0.8730	0.8935	0.8898
Adjusted R-squared	0.6442	0.7644	0.6655	0.7997	0.6574	0.5667	0.7533	0.8596	0.8326	0.8596	0.8548

## 5. Concluding remarks

This chapter summarizes data collected from various sources and used them to estimate the number of general *haigui* in each province in 2008. This analysis led to the most comprehensive and latest dataset on the distribution of general *haigui* in China. It is thus possible to observe a general picture of how general *haigui* are distributed. The estimation results show that general *haigui* are dispersed in a severely uneven way. The coastal provinces have attracted the vast majority of them. The two largest coastal metropolises, Beijing and Shanghai, have taken in almost half (47.2%) of the stock in China. The numbers of general *haigui* in these two metropolises are close, but Beijing has slightly more than Shanghai. Inland provinces are at a disadvantage in attracting *haigui*.

Restrained by the lack of data, the discrete choice analysis was not successful. A linear regression analysis was conducted instead, to determine the factors affecting the distribution pattern. The reason for the distribution pattern is mainly economic. The stock of general *haigui* is higher in high income areas. It is understandable that higher income attracts *haigui* talents. Meanwhile, income might not be the only reason because a high level of economic development is usually accompanied by better medical services and a more creative milieu. It is hard to separate the effects of creative milieu from those of economic reasons. However, the influences of 3T indicators were tested as substitute explanation of economic reasons.

In the model with all 3T factors and no economic variables, it was found that *Talent* power and *Tolerance* have strong effects on increasing the stock of general *haigui*, whereas the effect of *Technology* power is not always significant.

Two *Tolerance* indices of population diversity and bohemian share are found positively related.

The positive relationship with *Talent* power, on the one hand, indicates that general *haigui* are attracted to places where highly educated talents tend to gather, on the other hand, means they show a distribution pattern similar to that of other talents. The differences between general *haigui* and native talents, in distribution and locational choice behaviors, are reduced as the number of general *haigui* increases.

Regarding the technology power, the *innovation* index is found significantly related while the other two indices representing *R&D investment* and *high-tech share* are not. This may be because general *haigui* have diversified occupational choices beyond the high-tech arena. The growing number of general *haigui* has largely enriched the supply of *haigui* talents. Thus, *haigui* talents are no longer scarce as they were in the years before 21st century when most *haigui* talents were absorbed in high-tech related occupations. *Haigui* talents are now evaluated much more objectively by employers, supposedly in the same way their native-educated counterparts are evaluated. They have dispersed into diversified occupations,

including some ordinary ones not related to high-tech.

Against this background, the occupational choices of *haigui* talents are much more diverse. It has become necessary to look more closely at *haigui* talents in different occupations or roles, such as employers or high-tech entrepreneurs. Chapter V discusses their locational choice behaviors.

## References

- Benson-Rea, M. and Rawlinson, S. (2003). Highly skilled and business migrants: Information processes and settlement outcomes. *International Migration*, Vol.41, No.2: p.59-79.
- BodVarsson, O. B. and Berg, H.V. (2009). *The economics of immigration: theory and policy*. Dordrecht, Heidelberg, London, New York: Springer.
- Chinese Service Centre for Scholarly Exchange (CSCSE) of MOE, Torch High Technology Industry Development Centre of MOST and Technological Service center of Beijing Overseas Talents Center (BOTC) (various year). *Returned Chinese scholars pioneer yearbook*. Beijing: China Financial and Economic Publishing House.[Translated from Chinese, 教育部留学服务中心,科技部火炬高技术产业开发中心,北京海外学人科技服务中心编(各年份).「中国留学人员创业年鉴」,北京:中国财政经济出版社.]
- Dai, Erbiao (2012).*New immigrants and Chinese economic development: From brain drain to brain circulation*. Tokyo: Taga Shuppan. [Translated from Japanese 戴二彪 (2012 月). 新移民と中国の経済発展—頭脳流出から頭脳循環へ.東京:多賀出版.]
- Dahl, M. S. and Sorenson, O. (2009). The embedded entrepreneur. *European Management Review*, Vol.6, No.3: p.172-181.
- Florida, R. L., Mellander, C. and Qian, H. (2008). Creative China? The University, Tolerance, Talent in Chinese Regional Development. *Working Paper*. Stockholm, Sweden, CESIS, Royal Institute of Technology.
- Florida, R. L. (2008). *Who's your city? How the creative economy is making where to live the most important decision of your life*. New York, NY: Basic Books.
- Greenwood, M. (1997). Internal migration in developed countries. In Rosenzweig, M. and Stark, O. (eds.), *Handbook of population and family economics*. Amsterdam: Elsevier.
- Manski, C. F. (1977). The structure of random utility models. *Theory and Decision*, Vol.8, No.3: pp.229-254.
- National Bureau of Statistics (NBS) (various year). *Statistical yearbook of China*. Beijing: China

- Statistics Press. [Translated from Chinese 国家统计局(各年份). *中国统计年鉴*,北京:中国统计出版社.]
- NBS, Ministry of Human Resource and Social Security of China (MHRSS) (2008). *China labour statistical yearbook 2008*. Beijing: China Statistics Press. [Translated from Chinese 国家统计局, 人事部(2008). *中国劳动统计年鉴*,北京:中国统计出版社.]
- NBS, National Development and Reform Commission of China (NDRC) and Ministry of Science and Technology of China (MOST) (various year). *China statistical yearbook on high technology industry* Beijing: China Statistics Press. [Translated from Chinese国家统计局,国家发展和改革委员会,科学技术部编(各年份). *中国高科技产业统计年鉴*.北京:中国统计出版社.]
- Oriental Huibo Institution (2007). A report on the Chinese haigui [in Chinese]. *Huibo Research*, Vol.3, pp.22-34. [Translated from Chinese 慧博研究院 (2007). 中国 2007 海归人才现状调查报告. 慧博研究, Vol.3, pp.22-34.] Available at: <http://www.dongfanghuibo.com/huiboresearch/200707/index.htm>
- Powdthavee, N. (2008). Putting a price tag on friends, relatives, and neighbours: Using surveys of life satisfaction to value social relationships. *Journal of Socio-Economics*, Vol.37, No.4: pp.1459-1480.
- Saxenian, A. (2001). Silicon Valley's new immigrant entrepreneurs. *Working Paper No.15*. San Diego, Center for Comparative Immigration Studies, University of California.
- Sjaastad, L. A. (1962). The costs and returns of human migration. *The Journal of Political Economy*, Vol.70, No.5: pp.80-93.
- Tiebout, C. (1956). A pure theory of local expenditures. *Journal of Political Economy*, Vol.64: pp.416-425.

# **Chapter V: Analysis of the Locational Choices of *Haigui* Entrepreneurs**

## **1. Introduction**

### **1.1. Entrepreneurs of the creative class**

#### **1.1.1. Distributions of creative class in various occupations tend to be different**

Although the importance of people's creativity has been recognized in economics, not all the creative class contribute in the same way. It has been observed that the members of creative class are not homogeneous. Creative class comprises people with drastically different lifestyles, mobility tendencies, political views and amenity preferences (Markusen, 2006). Therefore, not all members of the creative class will be attracted the same places or respond to the same set of policies. Some researchers have held that the concept of creative class is too broad for specific development policies. Recent research emerged to divide creative class according to occupational groups, based on the precise skills that each occupation demands (McGranahan and Wojan, 2007; Abel and Gabe, 2010; Asheim and Hansen, 2009).

Different occupational groups of creative class tend to distribute differently and hence their effects on economic growth. Some occupations such as educators and healthcare professionals are evenly distributed across the national population and thus do not tend to affect regional productivity or wealth. Florida et al. found that excluding education and health occupations helped to achieve stronger growth relationships (Florida et al., 2008b).

On the other hand, most other creative occupations are impacting on regional development significantly. Examples are occupations relating to computer science,



management, engineering, artistic (Florida et al. 2008b), producer services and information (Abel and Gabe, 2010). The distributions of them are the results of personal choices, without being interfered with man-made quotas as are educators and healthcare professionals. Personal preferences are found to vary over occupations and lead to the uneven distributions, which result in the subsequent different effects on regional economies. For instance, Markusen and Schrock (2006) found that artists appear to be relatively more mobile, socially liberal, and sensitive to price levels compared to other members of the creative class. Asheim and Hansen (2009) claimed that the locational preferences of creative class are affected by the predominant knowledge bases required by local industries. They found that workers who require a synthetic knowledge base tend to favor a better climate for business and industry, while workers with analytical and symbolic knowledge bases tend to worry about a place's "people climate".

Entrepreneurial jobs require people to have a set of knowledge base and skills that are very different from those of employees. Moreover, the locational choice behavior of employees is largely restricted by the availability of jobs, whereas the self-employed entrepreneurs are able to select their locations of work more freely. We therefore have reasons to believe that entrepreneurs in creative class may behave differently from employed members. The extant research on the creative class in general may have limited value in guiding the policy making for attracting entrepreneurs.

### **1.1.2. Contemporary enterprises have more autonomy over choices of locations**

The locational choices of entrepreneurs used to be much narrower because of the low mobility of enterprises in the industrialized economy. Under early industrialization, regional development was largely dependent on production and producers were kept close to natural attainments such as mineral resources (iron, coal mines), transport networks (canals, seas, rivers) and power generation (canals, rivers).

With the advent of electricity, transport, power and communication were less confined to a specific place, but the sunk costs of large investments in equipment and facilities in advanced industrialization were still high. Once large factories were established in a place, they were hard to move and much less mobile compared with labor. Thus, cities or towns were organized around these large factories, and houses, shops, restaurants were built for workers to meet basic living needs. Usually, the consumption preferences of workers were subservient to production. The development of industrial town and industrial suburbs at the periphery of cities during the late nineteenth century has witnessed the industrial firm's primacy over the industrial worker (Walker and Lewis, 2001).

Today, with the further progress of transportation and communication technologies, firms can relocate offices, studios and laboratories with greater ease than assembly plants. The entrepreneurs enjoy more autonomy over where they start the business because post-industrial production is relatively footloose. Whether contemporary entrepreneurs are involving personal preferences in their locational choices or do they still focus on business success needs further observation. These questions are discussed in this chapter.

### **1.1.3. The role of entrepreneurs in creative class**

Florida (2002) explicitly distinguished four types of creativity. Entrepreneurial creativity is among them, along with the other three: (i) scientific creativity; (ii) technological or innovative creativity; (iii) artistic or cultural creativity.

Some have observed that all creativity in market is some kind of entrepreneurship. Kirzner (1973) defined entrepreneurship as spotting and acting on a previously unexploited profit opportunity. Thus, through entrepreneurship, creativity is manifested in market. Every endeavor in the market is meaningful, including the failures, because the profit and loss system is at work and will limit the resources available to unsuccessful entrepreneurs. Holcombe (2011) further suggested that entrepreneurship is central to the understanding of the creative class, because they

are defined as people who receive market remuneration for their services. He drew on Kirzner's (1973) theory of entrepreneurship to show creative work is entrepreneurial work. Either directly or indirectly, it amounts to profit-seeking creative changes from the habitual way of doing things within an evolutionary market process.

Entrepreneurial creativity, above other types of creativity, contributes to economy directly by transferring creative outputs into economically valuable commodities or services. Without it, other types of creativity would stop as ideas or innovations and not lead to economic growth. Regarding potential contribution to regional economy, the role of an entrepreneur and an employee is not completely equivalent. As a group who create job opportunities and tax revenues, entrepreneurs who start businesses make higher contributions and have more influences on the economy. However, traditional studies on locational choices have mainly taken the perspective of employees' side. Entrepreneurs are implicitly assumed to have the same importance and behavior pattern as employees, from both the standpoint of human capital (measuring talents by education) and creative class view (measuring talents by occupation). Entrepreneurs' locational preferences deserve more intensive attention and further analysis.

Focusing on entrepreneurs helps to clarify the causality of whether jobs are after people. Creative class theory has initiated a debate on "jobs or people, which go first". One of Florida's central propositions is "jobs after people", which is against the traditional cognition of "people after job" in regional economics. The latter has been criticized for the neglect of individual tastes and lay too much focus on the behavior of pursuing job opportunities as suggested in classical economic growth models (Florida et. al., 2011). Recent literatures on locational choices have paid more attention on people-related factors, such as individual tastes and generational tendencies. The shift from employment opportunity-based view to amenity-based view is exactly a manifestation of this trend (Glaeser et al., 2001; Clark et al., 2002).

People in highly creative occupations, i.e. the so called creative class, form the creative capital of a city, which will eventually draw enterprises with need for creative workers to locate there. Florida's followers Boschma and Fritsch (2009) has stated: "creative people not only generate novelties but also attract new economic activities, resulting in innovation businesses in the region. In other words jobs follow people, instead of people following jobs." It has been further clarified that such new economic activities are high-tech related industries (Marlet and Woerkens, 2005). However, the logics of "job after people" has been criticized for the reason that the mere presence of creative class does not necessarily lead to regional economic growth (Scott, 2006), or the gathering of creative class should be the outcome instead of the cause of economic growth. New evidence has also been found that high start-up rates of knowledge-intensive firms tend to take place in regions with relatively low shares of creative class people, but where concentration of human capital is relatively high (Hansen et al., 2009). All these criticisms and evidences suggest the researchers need to change the traditional way of studying creative class. Instead of the whole creative class, we should focus on those who create job opportunities to finish the discussion on whether "jobs after people".

This study contributes to the creative class research by offering an empirical case of specific occupation – entrepreneurs, and also tests whether "jobs after people" establishes in high-tech industries. The focus on the employers of creative class is brand new and important in complementing the whole discussion on creative class.

## **1.2. Increasing attention to *haigui* entrepreneurs in China**

### **1.2.1. The need for entrepreneurs – China needs to enhance its ability to transfer technological outputs into economic gains**

After several decades of investing in higher education, China has made great progress in accumulating human capital resources. At present, China grants the highest number of doctorate and master degrees in the world every year. In 2011,

China's number of R&D personnel ranked first in the world. Although the importance of human capital to regional growth has been commonly recognized by economists, human capital is required to participate in economic activities in order to generate economic benefits and thus promote regional growth. If talents are unemployed or underemployed, the resource of human capital is not fully tapped, and the country's investment in education is largely wasted. China is now facing the problem of a surplus of college graduates, whereas there are reports of shortages of simple labor in manufacturing industries. The progress in higher education and technology has not yet extended to industry. The industrial structure has not been upgraded to absorb the increasing supply of highly educated labors.

Among the challenges in upgrading industrial structure, technology power is traditionally considered the main constraint. However, due to the large investment in R&D, which ranked third (after the US and Japan) in 2011, China's scientific and technologic output has greatly improved and is catching up with the developed countries. The number of invention patents granted ranked third in the world (after Japan and the US) in 2009. In addition, Science and Technology (S&T) papers indexed by Science Citation Index (SCI), Engineering Index (EI) and Conference Proceedings Citation Index - Science (CPCI-S) ranked, respectively, second (after the US), and first and second (after the US) (MOST, 2011). The next challenge is to transfer technological output to economic benefits. High-tech industries need to be strengthened and more job opportunities need to be created for the highly educated labor force. *Haigui* entrepreneurs, who usually know about the latest progress in high-tech industries, and are deeply affected by business culture that encourages the commercial application of innovations, have played important roles in enhancing the country's ability to transfer technologies into economic gains.

### **1.2.2. The significance of *haigui* entrepreneurs in high-tech industries**

In spite of repeated government efforts to catch up, China's high-tech industries remained behind the world technological frontier throughout the 1990s. Although

China has invested heavily in infrastructure and S&E education and research, it has lagged in transferring technologies into economic benefits. The lack of people with managerial and manufacturing know how was a severe bottleneck in the development of high-tech industries in China until the return of *haigui* entrepreneurs largely relieved it.

An example is the Integrated Circuit (IC) industry. When the founders of Silicon Valley's Chinese American Semiconductor Professionals Association (CASPA) visited the Institute of Microelectronics at the Chinese Academy of Sciences in 1991, they concluded that mainland China was not yet ready for the IC industry and chose to focus instead on building business and professional connections in Taiwan. Another CASPA delegation that visited Shanghai in 1998 noted advances in the design skills and motivation of Chinese engineers but found few improvements in semiconductor manufacturing capabilities. Even in 1998, a delegation from the North American Chinese Semiconductor Association (NACSA) was impressed by the level of R&D and the technical expertise of Chinese scientists and engineers but also concluded that "the overall semiconductor industry in China lags far behind"—largely because it's unable "to transform the technology to commercial success." The members of the delegation described a research center in Wuxi that had "the best facilities among all of the places that we visited, but was also the best example of what one should be concerned about in China." The lack of managerial and production expertise and the limited understanding of markets and customers worried them about the outlook of the IC industry in China (Saxenian, 2006).

The IC industry achieved significant progress when the Semiconductor Manufacturing International Corporation (SMIC, i.e. "中芯国际") and the Grace Semiconductor Manufacturing Corporation (GSMC, i.e. "宏力半导体") built IC foundries in Shanghai. Along with the manufacturing line of IC industry, the two teams of investors with overseas experiences brought managerial know how as well as capital and technology to mainland China from Taiwan and Silicon Valley in 2001.

The two companies quickly surpassed other competitors, including established multinational investors with long histories in China, such as NEC and Motorola. SMIC attained a technological level in standard mass production that was only two years behind the world frontier, compared to the usual eight to ten years behind in the mid-1990s. By 2003, China's most advanced producers were producing 130- and 180-nanometer processes, thereby surpassing the 250-nanometer design standard that had been used by governments in Taiwan and the US to distinguish sensitive or critical technologies that they were not willing to have transferred to China (Saxenian, 2006).

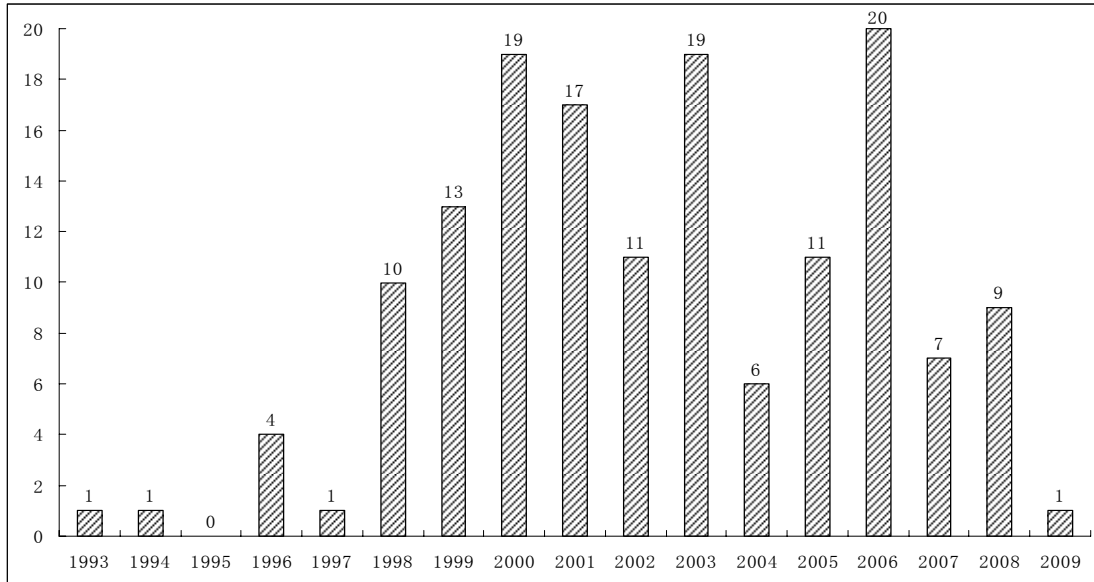
This accelerated upgrading, which was driven by *haigui*, happened not only in the IC industry, but also in other high-tech industries. For example, many China's leading IT companies are started by *haigui*, such as Sohu, Baidu, Yilong, Ctrip, Dangdang, and so on. The new energy industry has also progressed and SunTech, founded by an Australian *haigui*, Shi Zhengrong, has become the world's largest producer of solar panels.

These examples highlight the significance of overseas Chinese who have brought managerial and technical expertise back to mainland China. The rush of *haigui* entrepreneurship in Taiwan and Israel during the 1980s and 1990s brought remarkable economic growth there. A similar trend has occurred in India and China in the 2000s after the setback of the world economy at the turn of the century. China needs to make use of this trend and tap the potential of *haigui* entrepreneurs effectively.

### **1.2.3. The boom of *haigui* start-up parks**

Local governments have been setting up start-up parks for *haigui*. The number of *haigui* start-up parks has increased quickly since the first one was established in Nanjing in 1993. The rush of start-up parks has lasted for a decade from 1998 to 2008, until the debate of whether there were too many start-up parks arose (see Figure 8).

**Figure 8. The number of *haigui* start-up parks set up in various years**

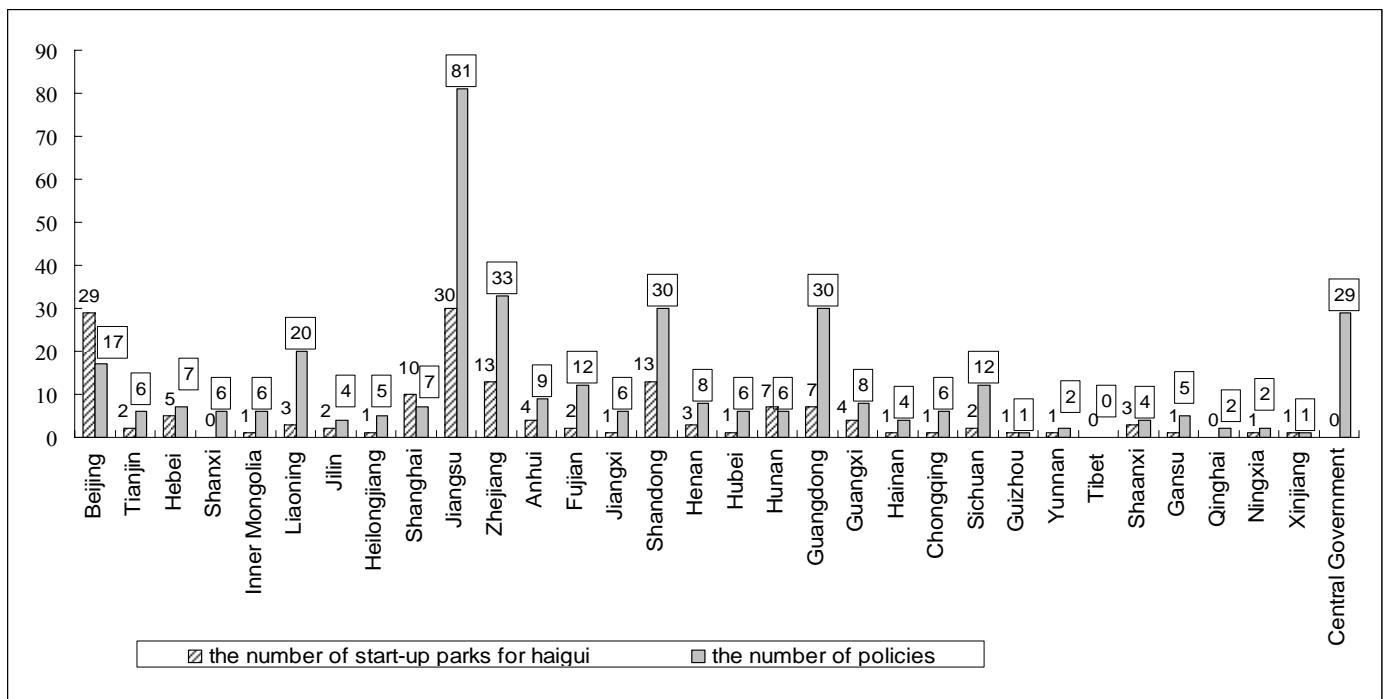


Source: summarized by the author based on *Returned Chinese Scholars Pioneer Yearbook* (CSCSE, et al., various year).

By the end of 2009, 150 start-up parks for *haigui* had been built, as shown in the distribution presented in Figure 9. Fan and Cai (2011) counted the number of items of preferential treatment (see Figure 9). These included financial support, such as tax incentives, research funds, government subsidies, and subsidies or discounts on the purchase of a house or car. Non-financial support included arrangements for family, such as schools, job opportunities for spouses, locally registered residence status, entry to the social welfare system, registration of the company, and so on.

**Figure 9. The number of *haigui* start-up parks (until 2009) and items of preferential policies (2010)**





Source: *Returned Chinese Scholars Pioneer Yearbook* (CSCSE, et al., various year); Fan and Cai (2011, pp. 115).

In spite of these efforts in physical and technological infrastructures or direct economic incentives, not much has been done to improve financial institutions, the regulatory system, or the legal system. These issues require attention from both the central and local governments.

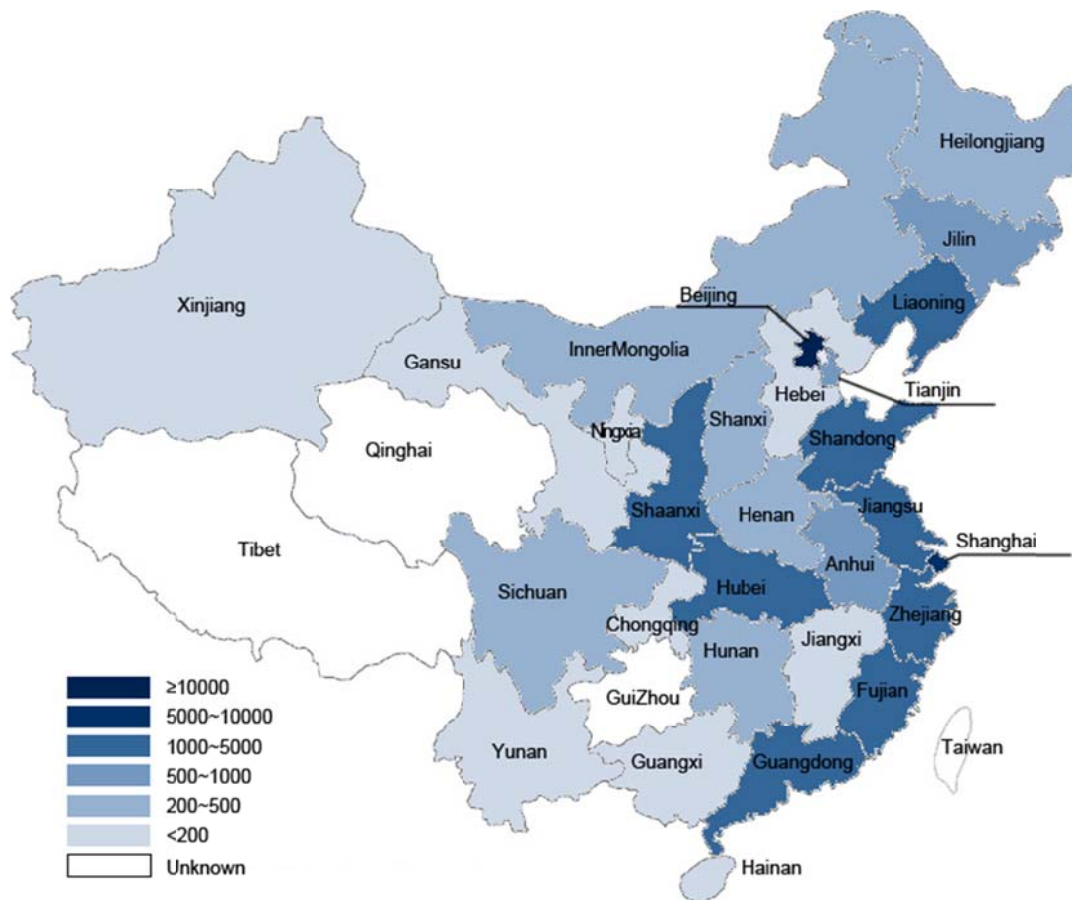
## 2. Distribution of *Haigui* Entrepreneurs

Despite all the large efforts of the country to support *haigui* entrepreneurs, there are no systematic statistics about their distribution, except the data based on 2003, which was released at the Exhibition of Chinese Returnees' Entrepreneurship Achievements held at Beijing in 2004. Since then no data have been systematically published although the number of *haigui* has grown very quickly and their distribution may also have changed in recent years. This chapter managed to

estimate their distribution is based on 2008, when the boom of returnee entrepreneurs has got close to its peak and the number of start-up parks for returnee entrepreneurs has got into a stabilized period. Thus we believe that this dataset is adequate to catch the fiercest change during the five years before 2008 and can reveal the latest distribution pattern.

Limited by the serious shortage of necessary information, data in all provinces cannot be estimated by the same method or obtained from the same source. The officially released data were adopted primarily for provinces with available data. After that, for provinces without published data, *haigui* data were estimated based on information in the nearest year. The results of the distribution pattern in each province are shown in Figure 10, and the details are listed in Table 24.

**Figure 10. Distribution of *haigui* entrepreneurs in China**



Source: estimated by the author; see Table 24.

**Table 24. Distribution pattern of generate *haigui* and *haigui* entrepreneurs in China**

	<i>Haigui</i> 2003	<i>Haigui</i> Entrepreneurs 2003	<i>Haigui</i> 2008	<i>Haigui</i> Entrepreneurs 2008	Share in 2008(%)
Beijing	40000	5000	80000	13443	34.2
Tianjin		345	10000	800	2.0
Hebei	1500	69	3075	142	0.4
Shanxi	3000	100	4000	200	0.5
InnerMongolia	1331	26	2729	201	0.5
Liaoning		380	24000	2863	7.3
Jilin		210	3439	565	1.4
Heilongjiang		146	6200	393	1.0
Shanghai	50000	4580	75000	7158	18.2
Jiangsu		976	36000	1800	4.6
Zhejiang	3000	589	9646	1595	4.1
Anhui	3000	206	4000	547	1.4
Fujian	4000	344	8200	1613	4.1
Jiangxi		31	508	135	0.3
Shandong	4000	448	9600	1115	2.8
Henan		95	1556	255	0.6
Hubei		330	5404	1100	2.8
Hunan	4000	157	8200	322	0.8
Guangdong	10000	866	24000	2079	5.3
Guangxi		120	1966	89	0.2
Hainan	300	14	387	35	0.1
Chongqing		40	3600	90	0.2
Sichuan	2600	231	5330	463	1.2
Guizhou			1100	unknown	-
Yunnan		64	1049	148	0.4
Tibet				unknown	-
Shaanxi		390	6387	2000	5.1
Gansu	1000	54	2050	77	0.2
Qinghai			200	unknown	-
Ningxia		11	176	34	0.1
Xinjiang	1800	20	3690	50	0.1

Source: Data in 2003 is from Exhibition of Chinese Returnees' Entrepreneurship Achievements held at Beijing in 2004. Data in 2008 is estimated from various data sources. Estimation processes of *haigui* and *haigui* entrepreneurs in 2008 can be found in Table 39

and Table 40, respectively, in the Appendix.

Table 24 presents the most recent estimation on Chinese *haigui* entrepreneurs' distribution since the officially published data in 2003. Although its accuracy still needs to be improved, the dataset portrays the general picture of the distribution of *haigui* entrepreneurs.

The new distribution pattern of *haigui* entrepreneurs reveals the following features:

- (1) Coastal provinces have more *haigui* entrepreneurs than inland provinces;
- (2) Beijing and Shanghai have numbers of *haigui* entrepreneurs that are overwhelmingly higher than other provinces, including other coastal provinces;
- (3) Among inland provinces, the central provinces have more *haigui* entrepreneurs than western ones.
- (4) *Haigui* entrepreneurs generally follow the same distribution pattern as general *haigui*. However, between Beijing and Shanghai, the differences in the distribution of *haigui* entrepreneurs are much larger than that of general *haigui*. Beijing has attracted many more *haigui* entrepreneurs than Shanghai whereas the number of general *haigui* is very close in the two cities. The reason for this unbalance lies partly in the fact that Beijing is the political center of China. The reason for this unbalance lies partly in the different roles of these two cities. The reason for this unbalance lies partly in the different roles of these two cities. Details will be discussed in section 4.2.

This analysis extends the Gini coefficient, which is used to measure income inequity, to the *concentration coefficient* used here to measure regional differences in the distribution of *haigui* entrepreneurs. The higher the coefficient, the less equity there is in people's distribution and a stronger tendency towards concentrating in certain regions. The concentration coefficient is calculated to be 0.746 in 2003 and drops to 0.728 in 2008. Regional differences reduced slightly during the five years.

Compared to the same coefficient of general *haigui* in 2008, which was found to be 0.685, the distribution of entrepreneurs is much more unbalanced than *haigui* in general.

### 3. Variables and Data

#### 3.1. Sampling method

In this analysis, the data were generated from hand-collected information of individual *haigui* entrepreneurs. The sample entrepreneurs were drawn from various sources, including reward programs (both national and local), Returned Chinese Scholar Pioneer Yearbooks, other publications about *haigui*, websites of Start-up Parks for Returned Students (归国留学生创业园), and so on.

National reward programs recruit entrepreneurial talents, such as the Recruitment Program of Global Experts (千人计划, which means *1000 experts plan*), Reward for Outstanding Returnee Entrepreneurs (华侨华人专业人士杰出创业奖), and so on. Local governments have also carried out various incentive plans, such as the *1000 experts plan* in Zhejiang province or the *100 experts plan* in Shaanxi province. Similar rewards issued by local governments were also tracked to identify *haigui* entrepreneurs.

In addition, many Start-up Parks for Returned Students have introduced successful cases to attract newcomers. *Haigui*-related associations have also released information on successful members. All these sources were used to expand the list of eligible samples, whose personal experience and individual attributes were then tracked by searching reports in newspapers, magazines, books, and websites and so on.

The above information resources suggest our samples are all *haigui* entrepreneurs who have caught intensive public attention. Most of them are known for significant

business success. Some others are noted because they are viewed as having high potential to change an industry and promote local economic development. In other words, the samples are the most successful and most potential of Chinese *haigui* entrepreneurs. By focusing on the best, this study offers highly valuable implications on talent attracting policies for local governments.

### **Definition of *haigui* entrepreneurs**

A *haigui* entrepreneur should meet the requirements of both *haigui* and entrepreneurs. *Haigui* (海归) is the abbreviation of *haiwai guiguo liuxuesheng* (海外归国留学生 or student returnees from overseas). Later its definition expands to refer all the highly qualified returnees who have at least a tertiary educational background and have been abroad for study, training, or work for at least one year.

Entrepreneurs are defined according to their position in a company. Specifically, only those in the position of CEO, general manager, chairperson of the board, and so on were considered entrepreneurs, under the rationale that only those people can make the final decision of where to locate the firm.

Starting up a company would no doubt make the founder a qualified research object, but this was not a requirement. Those who take over an existing company are also recognized as entrepreneurs and are included in our dataset, because when an entrepreneur takes over a company, it means he also accepts its location.

If an entrepreneur's business includes headquarters and branch companies, then his choice of destination choice was defined as where the headquarters are located.

If someone opened start-ups multiple times, his or her last choice was adopted. We assumed he or she had learned by trial and error, with regard to the location of the firm as well as many other factors. The last trial was assumed to be a mature decision after deep deliberation. If he or she had moved, the new place would be taken consideration. However, if he or she had just opened a branch company, the location would still be his prior choice.

### Description of sample dataset

A total of 798 samples were collected to build the database. These were distributed among  $N$  Chinese provinces ( $N=30$  in this study. Tibet is excluded from the alternative set for the lack of information about returnees), which forms the alternative set of choices. It was assumed that in choosing his return destination, each individual (sample) selected a location in one of  $N$  provinces. Values were assigned to the variables describing the sample's alternative sets ( $N$  provinces) according to the year when the choice of destination was made. The period ranges from 1991 to 2008. To illustrate, if a *haigui* was looking for a place to locate his company in 2000, then he chose from  $N$  ( $N=30$  here) provinces with variables in 2000. The values assigned to the variables (e.g., wage level, employment growth rate, etc.) of an alternative (e.g., Beijing), would be exactly those of 2000. The variables of the other  $N-1$  alternatives were processed under the same principle. Since the period ranges from 1991 to 2008 for 18 years, the total number of available provinces amounts to  $N*18$ .

### 3.2. Variables

The variables are listed in Table 25 and Table 26. The statistical summaries are shown in Table 27.

Since the research subjects in this chapter are employers instead of employees, their locational choices may not be relevant to the local wage level. Instead, their income is more closely related to the profits of enterprises. Therefore, the economic factors discussed here are connected to the performance of enterprises, such as market size, infrastructure, wage and land cost, as well as economic dynamics. The market size is the GDP size adjusted according to the connections with other provinces. Extending the market accessibility index in Harris (1954), an index of market size (Cheng, 2007) was developed in the following formula:

$$M_i = GDP_i + \sum_{j=1, j \neq i}^{30} \frac{GDP_j}{Dist_{ij}^2} - \sum_{j=1, j \neq i}^{30} \frac{GDP_i}{Dist_{ij}^2}$$

where  $M$  is the market size, and  $Dist_{ij}$  is the railway distance between provincial capitals of province  $i$  and  $j$ . Infrastructure is measured by transportation density, which equals the total length of highway (km) divided by the area ( $\text{km}^2$ ) of the province. Two kinds of cost are considered here: labor cost, which is measured by the average wage level; land cost, which is measured by the average housing price. Economic dynamics is defined as the average employment growth rate during the last 3 years.

The above economic variables are adjusted to fit the entrepreneurs' benefit. Variables representing 3T power, amenities, and social connections are the same as those used in Chapter V.

Besides the variables describing places, in other words, the alternative provinces, there are also variables representing personal information, including age, highest degree, length of time abroad, experience abroad (including whether obtained a diploma abroad or not; whether worked in a foreign enterprises or not; whether worked in a research institute or university abroad; whether started a company abroad), and the name of the host country.



**Table 25. Descriptions and sources of place variables**

Categories	Variables	Description	Sources	
Economic factors	Market size	the logarithm of national market size (million RMB)	<i>Statistical Yearbook of China</i> (NBS, various year)	
	Infrastructure	provincial transportation density		
	Cost	the logarithm of provincial average housing price per square meter(RMB) plus average wage level(RMB)		
	Economic dynamics	average employment growth rate during the past 3 years		
Amenities	Medical services	the logarithm of the number of doctors per 10000 population		
	Education services	the logarithm of the number of teachers in Middle and Elementary Schools per 10000 population		
	Culture offerings	the number of art performance troupes per million population		
Creative milieu	Talent	the percentage of people with college or higher level education background within the population over 15 years old		CADZ( <a href="http://www.cadz.org.cn/en">www.cadz.org.cn/en</a> )
	(Tolerance) Population diversity	the percentage of residents without local <i>hukou</i> (registered residence status) among the total population		
	(Tolerance) Openness length	the time period from when the first national-level development zones up to 2009		
	(Technology) Innovation index	the number of patents per 10000 population		
	(Technology) R&D investment	the percentage of R&D investment in the industry output (%)		
	(Technology) High-tech index	the share of high tech industry output in the total industry output (100%)	<a href="http://www.sipo.gov.cn/">http://www.sipo.gov.cn/</a> <i>China Statistical Yearbook on High Technology Industry</i> (NBS, various year)	
Social connections	Birthplace	=1, if the alternative province is one's birth place; =0 otherwise	hand collected	
	Studied-place	=1, if the individual has ever studied (for tertiary education or higher) in the alternative province; =0 otherwise		
	Worked-place	=1, if the individual has ever worked in the alternative province; =0 otherwise		
Policy	Preferential policy	the number of <i>haigui</i> start-up parks in each province	<i>Returned Chinese Scholars Pioneer Yearbook</i> (CSCSE, various year)	

**Table 26. Description of personal variables**

Variables	Description	Sources
Gender	1=male, 0=female	hand collected
Ln_age	the logarithm of one's age in year 2011	
Degree	one's highest degree. doctor degree =3, master degree=2, bachlor degree =1	
Ln_timeabroad	the logarithm of the number of years one has stayed road (plus 1)	
Life abroad	=1 if one has a life abroad (in the way that have a foreign nationality or Permanent Residence status, or have an occupation abroad)	
Exp_diploma	=1, if one has obtained a diploma from universities abroad	
Exp_enterprise	=1, if one has work experience in enterprises abroad	
Exp_research	=1, if one has work experience in research institutes or universities abroad	
Exp_startup	=1, if one has experience of starting up a comnapy abroad	
If_NorthAmerica	= 1, if the individual has resided in countries of North America; =0 otherwise. The member countries mentioned in our case database include United States, Canada, Cuba.	
If_AsianOceania	= 1, if the individual has resided in countries of Asia; =0 otherwise. The member countries mentioned in our case database include Australia and New Zealand. Japan, Korea, Singapore, China Taiwan, China Hong Kong, China Macau, India, too, Indonesia, Cyprus, Philippines, Vietnam, and Malaysia.	
If_Europe	= 1, if the individual has resided in countries of Europe; =0 otherwise. The member countries mentioned in our case database include Netherlands, Greece, Finland, Norway, Scotland, Russia, Spain, Hungary, Austria, France, Britain, Germany, Belgium, Ireland, Switzerland, Italy, Denmark, Czech Republic, Scotland, Ukraine, Wales, as well as the name of the continent Europe.	

**Table 27. Statistical summaries**

Variable	Obs <sup>(1)</sup>	Mean	Std. Dev.	Min	Max	Cases <sup>(2)</sup>
Market Size	24738	8.106	1.156	3.419	10.584	
Infrastructure	24738	0.483	0.383	0.016	2.513	
Cost	24738	9.670	0.572	7.637	11.244	
Economic dynamics	24738	1.015	0.021	0.940	1.129	
Medical services	24738	2.801	0.293	2.245	3.881	
Education services	24738	4.447	0.300	3.158	5.383	
Cultural offerings	24738	2.926	3.046	0.632	23.689	
Population diversity	24738	0.085	0.070	0.000	0.455	
Openness length	24738	18.323	4.941	8	25	
Talent	24738	0.068	0.050	0.001	0.326	
R&D investment	24738	0.103	0.134	0	0.980	
Innovation index	24738	1.320	2.196	0.004	18.172	
High-tech index	24738	0.092	0.082	0.004	0.379	
Preferential policy	24738	2.897	4.809	0	30	
Birth place	24738	0.021	0.145	0	1	
Studied-place	24738	0.032	0.177	0	1	
Worked-place	24738	0.015	0.122	0	1	
Gender	24738	0.935	0.247	0	1	
Ln_age	21452	3.834	0.153	3.296	4.357	692
Degree	24521	2.579	0.587	1	3	791
Ln_timeabroad	23064	2.274	0.589	0.693	4.025	744
lifeabroad	24738	0.252	0.434	0	1	798
exp_diploma	23901	0.785	0.411	0	1	771
exp_enterprise	24738	0.568	0.495	0	1	798
exp_startup	24738	0.188	0.391	0	1	798
exp_research	24738	0.310	0.462	0	1	798
If_NorthAmerica	24738	0.675	0.468	0	1	798
If_AsiaOceania	24738	0.209	0.407	0	1	798
If_Europe	24738	0.192	0.394	0	1	798

Note (1): The model takes each case's choice on each alternative as one observation. Since there are 31 provinces, there are 31 observations for each case. The total number of observations is the number of cases multiplied by 31.

Note (2): The numbers of cases are listed in the last column. There are 798 cases; the

variable with missing values will have less than 798 cases.

### 3.3. Description of samples

Closer examination of the case variables allows a clearer description of the samples. Of the 798 cases, 5.9% have a bachelor degree as the highest degree; 31.7% have a master degree, and 62.4% have a doctoral degree.

The majority of our samples are male (93.5%); only 6.5% are female.

Their ages in 2011 ranged from 27 to 78, with an average of 46.8. More than 60% are in their 40s and early 50s.

**Table 28. Ages of the samples**

age	27~29	30~34	35~39	40~44	45~49	50~54	55~59	60~64	65~69	70~74	75~78	unknown
no. of cases	4	28	78	116	261	129	52	14	8	1	1	106
percentage(%)	0.6	4.0	11.3	16.8	37.7	18.6	7.5	2.0	1.2	0.1	0.1	/

The length of time that they stayed abroad ranged from 1 year to 55 years. The average is 10.3 years.

**Table 29. Length of time abroad**

timeabroad	1~5	6~10	11~15	16~20	21~25	26~30	31~55	unknown
no. of cases	164	255	187	94	37	5	4	54
percentage(%)	20.6	32.0	23.4	11.8	4.6	0.6	0.5	6.8

25.2% of *haigui* entrepreneurs (201 cases) still had a connection abroad, such as foreign nationality, permanent resident status in a foreign country, or an occupation abroad.

Regarding their experience abroad, the share of those who obtained a diploma abroad was 75.5% (605 cases); the remaining 20.8% had no foreign diploma, and 3.4% were unknown.

A total of 56.8% (453 cases) had experience of working in enterprises abroad; 31% (247) had experience of working in research institutes or universities abroad; 18.8% (150) had started their own business abroad.

Of these cases, 27.8% located their company at their birthplace; 41.7% at where they had studied and 24.8% at where they had worked before.

**Table 30. The respondents' connections with locations**

relationships with the places	no. of cases	percentage (%)
choice=birthplace	222	27.8
choice=studied-place	333	41.7
choice=worked-place	198	24.8
choice=birthplace=studied-place	132	16.5
choice=birthplace=worked-place	79	9.9
choice=studied-place=worked-place	136	17.0
choice=birthplace=studied-place=worked-place	64	8.0

Most *haigui* entrepreneurs returned from the US (60.5%, 485 cases). There is a unique culture in the US, especially in the Silicon Valley, which encourages entrepreneurship (Saxenian, 2006). This entrepreneur spirit cultivated by the US has encouraged many *haigui* to set up a company. 67.5% (539 cases) of the sample *haigui* entrepreneurs were in North America, mainly including those returned from the US; 20.9% (167 cases) were in countries in the Asia-Pacific region among whom 12.5% (100 cases) returned from Japan; 19.2% (153 cases) were in European countries.

Not many had been to more than one region, as shown in Table 34. Only 2.3% (18 cases) had stayed in both the US and Japan.

**Table 31. The respondents in multiple host countries**

relationships of the places	no. of cases	percentage (%)
If_NorthAmerica=If_AsiaPacific=1	33	4.1
If_NorthAmerica=If_Euro=1	33	4.1
If_AsiaPacific=If_Euro=1	11	1.4
If_NorthAmerica=If_AsiaPacific=If_Euro=1	1	0.1

According to the limited information, at least 25.19% of the *haigui* samples were known to maintain a life abroad. The share would have been larger if full information had been available for every sample. These people commute across national boundaries. They either have a position abroad, or their family members (wife and children) are abroad. They are called *haiyan* (a metaphor of 海 plus 燕, which means petrel or more literally “sea birds”). Actually, maintaining connections with a technological core, particularly the Silicon Valley, has ensured the economic success of Taiwan, Israel, and more recently India (Saxenian, 2006). Mainland China can also benefit from developing these kinds of long distance collaborations.

### 3.4. Nested decision trees

In this research, an alternative-specific conditional logit model (*asclogit*) was first applied. However, the results of the Hausman-McFadden test showed that the IIA property does not hold for all 30 alternative provinces, as shown in Table 32.

**Table 32. The results of Hausman-McFadden test in conditional logit model**

	chi(2)	p	no. of cases
Beijing	-86.53		269
Tianjin	<b>85.53</b>	<b>0</b>	16
Hebei	-2.21		3
Shanxi	-11.46		4
InnerMongolia	-5.67		5
Liaoning	-34.94		59
Jilin	-56.09		12
Heilongjiang	5.28	0.9815	8
Shanghai	-15.67		144
Jiangsu	7.7	0.9046	36
Zhejiang	-30.37		32
Anhui	5.53	0.977	11
Fujian	-9.37		33
Jiangxi	-159.42		3
Shandong	-11.66		23
Henan	2.38	0.9998	6
Hubei	-7		22
Hunan	4.06	0.9951	7
Guangdong	-48.26		42
Guangxi	18.04	0.1561	2
Hainan	-2.77		1
Chongqing	0	1	2
Sichuan	-13.54		10
Guizhou	12.61	0.4782	0
Yunnan	10.87	0.6962	3
Shaanxi	-67.75		40
Gansu	<b>94.15</b>	<b>0</b>	2
Qinghai	-2.68		1
Ningxia	-0.57		1
Xinjiang	-0.64		1

The results indicate that Tianjin and Gansu did not pass the Hausman-McFadden test. Omitting either of them will cause a systematical change among the coefficients of parameters, indicating a violation of the IIA assumption. Simply deleting these two places from the alternative set will not solve the problem because (i) if we drop the two places and rerun the Hausman-McFadden test, new alternatives would be

found to violate the IIA assumption; and (ii) *Tianjin* has quite a number of *haigui* entrepreneurs and since it occupied a share of about 2%, it cannot be ignored.

There is another reason why the alternative-specific logit model is inappropriate. We already know that *asclogit* reports coefficients for case-specific variables in each province. In the dataset, there are alternative provinces with too few cases (one or less). In those provinces, the numbers of cases are not enough to analyze the *asclogit* model, that is, there are not enough degrees of freedom.

Both the problem of the IIA assumption and degrees of freedom can be solved by using the nested logit model, which groups similar alternatives into one nest.

There are different ways to specify one's decision tree in a nested logit model by grouping alternative provinces in different ways. Figure 11 to Figure 14 show four types of decision trees constructed for *haigui* entrepreneurs. The STATA result shows that all the four types passed the initial LR-test for the IIA test, which means they perform better than the *asclogit* before the nests were constructed.

Although the first three nested models are also eligible, we used the fourth because it reveals more information about the results. As shown in Figure 14, in this nested tree structure, nine nests are firstly defined, each of which involves one coastal province. The nest is named after the province it includes. Thus, nine coastal nests are primarily defined, which are Beijing, Shanghai, Liaoning, Tianjin, Shandong, Jiangsu, Zhejiang, Fujian and Guangdong. Then, inland provinces are divided into two nests. The first nest is named "inland\_a" group which involves Anhui, Jilin, Shaanxi, Hubei and Sichuan, which are relatively popular in inland. The second nest is denoted by "inland\_b" and involves all the rest nineteen provinces.



Figure 11. Specification (1) of *haigui* entrepreneurs' decision tree

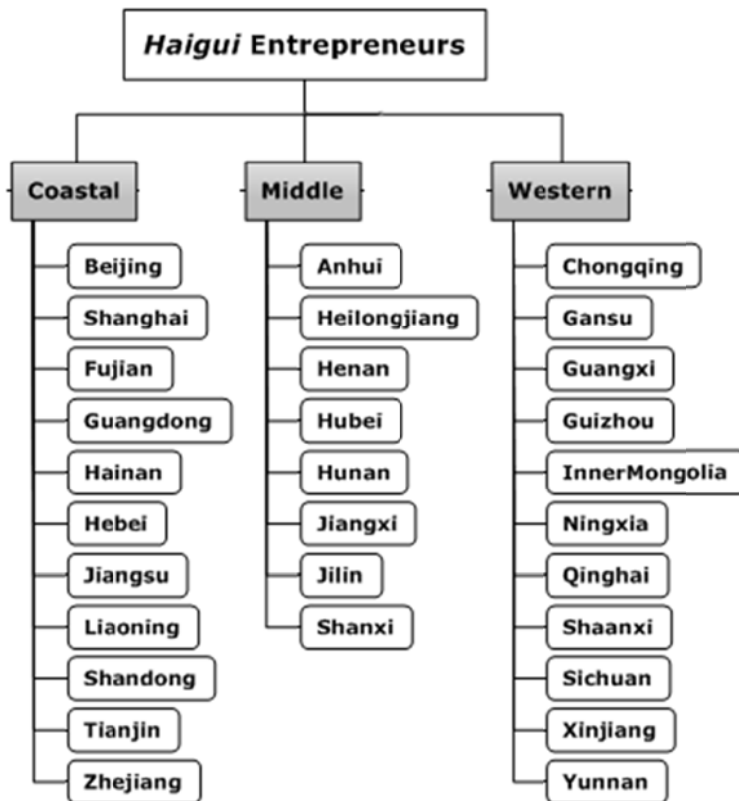


Figure 12. Specification(2) of *haigui* entrepreneurs' decision tree

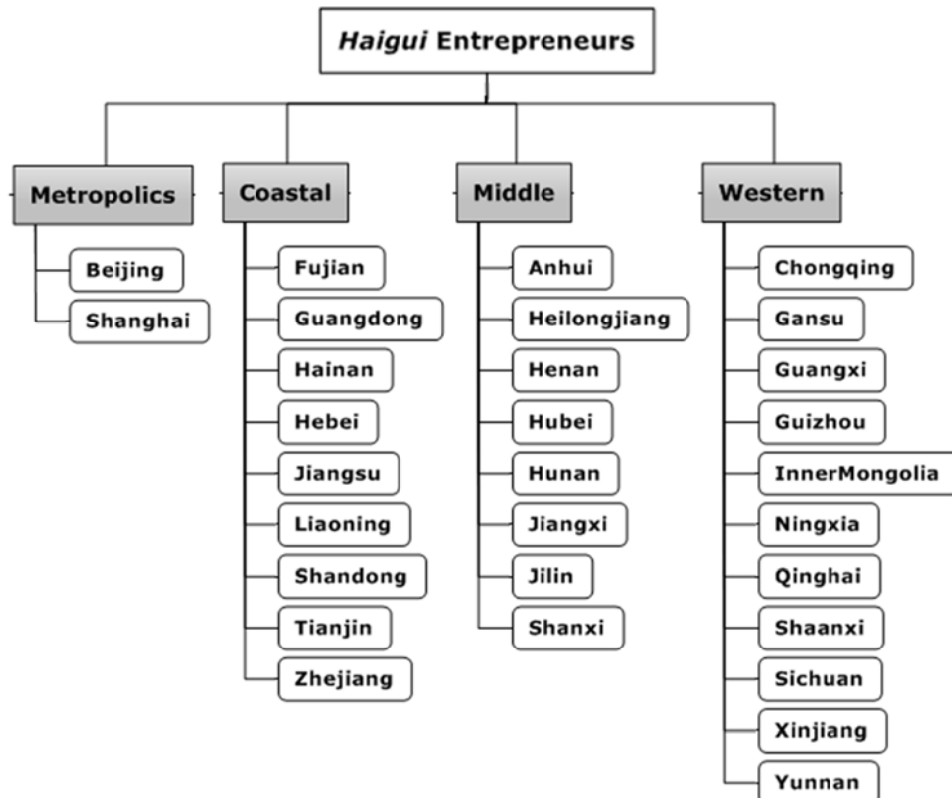


Figure 13. Specification(3) of *haigui* entrepreneurs' decision tree

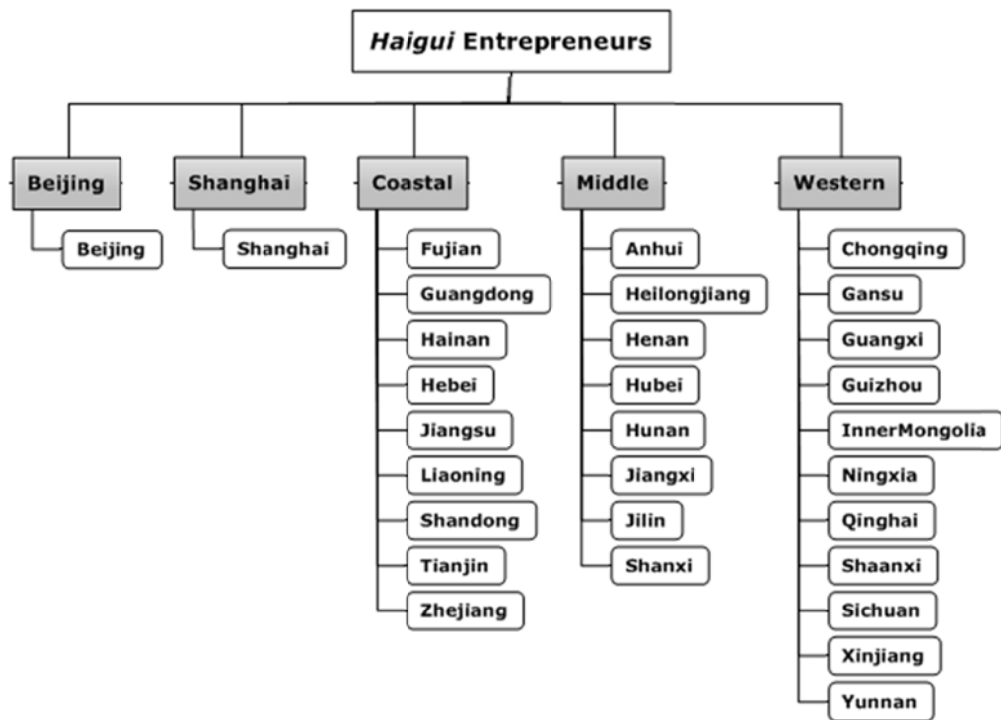
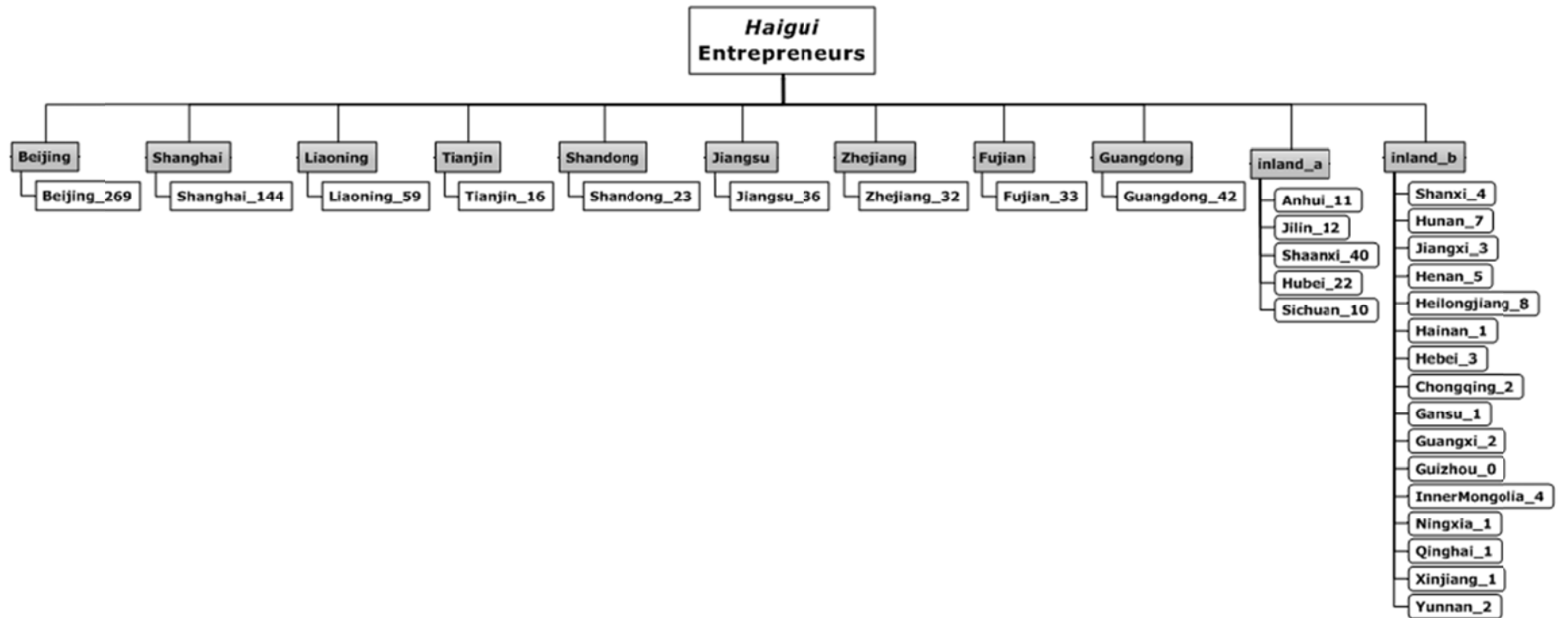


Figure 14. Specification(4) of *haigui* entrepreneurs' decision tree



Note: The number behind each province shows the number of cases

## 4. Results and Discussion

### 4.1. Influence of the place variables

#### *Creative milieu – tolerance*

The proportion of people without local *hukou* was used by Florida et al. (2008a) as an indicator of tolerance in China. In this research, which takes *haigui* entrepreneurs as an example of a creative class, this tolerance index was not found to be significantly relevant to their locational choice behaviors. The relationship is not only weak but also negative. However, it is hard to jump to the quick conclusion that tolerance does not affect the locational choices of *haigui* entrepreneurs. Future research should perform more tests using indicators that are more prevailing, such as homosexuals, foreigners, and bohemians. In fact, the current *hukou* system does not directly limit migration. Residents can still freely choose where to work or live. Limits come from the fact that their social welfare and long-term interests may not be properly protected if they leave their registered residence. Generally, people without local *hukou* choose their work place based on short-term economic gains. They are not as socially excluded as gays, foreigners, or avant-garde artists and are not as sensitive to a place's tolerance. Hence, the share of people without local *hukou* may not be the right variable to describe place tolerance in China.

Another index is also generated to represent tolerance in China. It is well known that China used to be a closed nation stopping trade with the international world for about three decades. Consequently, business ideas and culture generated in China are relatively closed and backward. The opening up began in 1978 and the Development Zone used to be the only window to do business with foreign countries and enjoy preferential policies, such as tax exemption, low rent, and so on. By connecting to the outside world, Chinese businesspersons learn about international society, including the standardization of acts as well as diluting the role of social relationships. So in general, more contact with foreign countries indicates a more

open and tolerant atmosphere. Hence, this study used a new indicator—the length of time since the first national development zone was established—to measure the openness of a place. However, the results were negative (although not always significant). This may imply that we need a better index, instead of the number of years since the first national development zone was established, to represent the openness of a place; after all, factors like the frequency of exchanges and degree of collaborations may have been quite different after the opening up.

However, along with the results of the first tolerance index, there is also the possibility that creative entrepreneurs do not value tolerance in current China. Instead, the opposite of tolerance, i.e., close social relationships are used as resources. In China, the locational choices of the creative class are still “interests oriented.” They can rarely gain spiritual utility from the tolerance and openness of a place. Contrary to Florida’s (2002) ideas that the creative class tends to move to places with loose relationships, our creative entrepreneurs still value close social relationships.

#### ***Creative milieu — talent power***

Talent power was found to be positive but not significant when the IIA assumption was satisfied. Entrepreneurs need to hire a sufficient number of qualified personnel to run their enterprises. The talent power of a place should be attractive to entrepreneurs and affect their choice of where to locate a company. However, this study shows opposite results. The reason might be that China has trained a powerful talent team and almost every province has adequate talents if measuring on the education level. Thus, for *haigui* entrepreneurs, the level of talent power is not a decisive factor. The argument of “jobs follow people” does not hold based on current evidence.

#### ***Creative milieu – technology power***

Technology power was found to be closely related to the locational choices of *haigui* entrepreneurs. It is worth noting that the results showed positive relationships with R&D investment and the share of high-tech industry output, but not with the

average number of patents. This means *haigui* entrepreneurs pay little attention to the technological output and they are not attracted to patents already granted. Other people's innovations do not affect them because the majority of them return with their own technologies and ideas, which are usually more advanced than the domestic ones. This fact reveals the confidence of *haigui* entrepreneurs and highlights their role in promoting the nation's technology power. Thus they do not rely on the existing technology outputs. What they need is the support to initiate high-tech enterprises and continue R&D work.

Investment in R&D is important because even mature technologies will require changes when transferred into commodities. These technological outputs need constant updates and adjustments, either to meet the needs of local markets, or to accommodate the changeful market needs. R&D is essential for the commercial success of high-tech products. Thus, the increasing support on R&D work will make a place attractive to *haigui* entrepreneurs.

A high share of high-tech industry indicates a well-established base to transfer technological innovations into marketable commodities. There should be necessary facilities and a stock of professional talents, along with an information network, related service companies (e.g., consulting, accounting, and so on). In the best cases, there should be upriver and downriver industries in the industry chain. By locating in a place with high-share high-tech industries, *haigui* entrepreneurs can take advantage of the clustering effect and expect growing returns.

### ***Economic factors***

Economic factors are very decisive in the locational choices of *haigui* entrepreneurs. Economic dynamics, represented by the average increasing rate of employment opportunities, along with market size, were found strongly effective in locational choice behavior. These results prove that *haigui* entrepreneurs are attracted back to China by the big market and the dynamic economy.

The hypothesis with lower cost is rejected by the evidence. Instead, the effects of costs were found positive (although not always significant), which means *haigui* entrepreneurs prefer areas with higher cost. This is because other economic conditions are so beneficial that they can compensate for the high cost. Moreover, the cost level is still quite low compared to that in developed countries. Therefore, the entrepreneurs do not need to circumvent high cost regions. Another reason is that high costs indicate a better entrepreneurial environment, including a high level of talent and high consumptive power of the market. However, these correlations are not direct enough to be revealed in the regression results.

### ***Amenities***

The results show that cultural offerings were unrelated or negatively related to locational choice. In provinces with a large number of *haigui* entrepreneurs, cultural offerings are at a relatively low level. On the other hand, western provinces with very few *haigui* entrepreneurs have a high level of cultural offerings. One explanation of this finding is that *haigui* entrepreneurs are more focused on their businesses and not interested in cultural enjoyments. That's in consistence with the evidence that they are highly concerned with the factors closely related to success, such as market sizes and economic dynamics. Therefore cultural activities may not be among their top priorities. Also, the other explanation might be that they are a highly mobile population and can enjoy cultural amenities at the international level. As described in subsection 3.3 of Chapter V, in a very conservative estimate, more than 25% of *haigui* entrepreneurs commute across national borders (permanent status or nationality in a foreign country, business abroad, family members living abroad etc.). They can access cultural resources in international society, so they appear indifferent to cultural offerings in Chinese provinces. Hence, a city or a province with poor cultural offerings would not dampen their enthusiasm to start their venture there.

However, whether the negative coefficients indicate a repulsion effect still needs discussion. The data used here are the number of art performing groups for every one million population. Most of these groups are official institutions that are planned and set up by the official departments of the government. These performing groups do not have full freedom in art expression for two reasons: first, the art programs are screened to make sure they do not violate the ideology of the country; second, they serve as propaganda to shape public opinion. Therefore, *haigui* entrepreneurs might not welcome the contents of these art performances. However, we can hardly say these government-sponsored arts push *haigui* entrepreneurs out. It might be more appropriate to say that *haigui* entrepreneurs appear indifferent.

Public services were found to be a positive influence on locational choice (although sometimes insignificant). The places' abilities to supply both medical and educational services were found to have a positive coefficient. These results showed that good public services attract *haigui* entrepreneurs. However, the effect was not always significant. In fact, *haigui* entrepreneurs, especially those as successful as our samples, enjoy amenities at the international level, which extends from cultural offerings to medical and educational services. As previously mentioned, more than a quarter of the samples maintain a life abroad (permanent status or nationality in a foreign country, business abroad, family members living abroad etc.). The share would be larger than 25% if full information was available. For these international commuters, the level of public services in China does not matter much. However, for the rest who have returned fully along with their family members to China, public services would still affect their locational choices.

### ***Social connections***

Strong positive relationships were found between social connections and locational choice. The coefficients for the three types of connections are in the following order: birthplace > work place > study place. This suggests that social



connections to a familiar place do attract *haigui* entrepreneurs to locate there. The social ties to birthplace are the most affective factors of the three types, with work place next and college city third.

It is worth noting that when the variables of social connections are included, our model cannot satisfy the IIA assumption. The results of other variables are obtained from a model without social connection variables. The explanation might be that places cannot be properly grouped by social connections. For example, provinces can be categorized into economically developed and undeveloped groups, but they cannot be divided into birthplace or non-birthplace groups for multiple individuals.

#### ***Social connections and tolerance***

The reliance on social connections and the insignificant results of tolerance together forms the strongest results in this chapter. It forms a new observation which does not align with Florida's creative class theory, because a society that relies on social networks is the opposite of a tolerant milieu. While creative class in Western society are attracted to tolerant, open, loose-connected places, our research objects of *haigui* entrepreneurs does not behave in the same way.

Why do social ties matter this much in China? One possible reason lies in the cultural differences between China and Western society. Compared with the Western world, Asian countries, including China, have much closer social relationships. Social connections have significant meanings in Asian culture, where even remote relatives matter. In Western countries, the connection with relatives usually ends within a few generations. Interestingly, Western countries have experienced the rise in popularity of artificial networking via the internet, such as Facebook, Twitter, etc., which might be interpreted as replacing Asian's human connections and resulting in looser social connections. Another reason might be China's stage of development. In an emerging economy like China, from the nation to individual citizens, too much focus has been placed on economic growth. The country to large extent remains a society with strong top-down management system, where individual idiosyncrasies

are usually ignored and sacrificed. China has more years to go in this stage. Returnees should also have been affected by this cultural background. They may not have chosen returning to the home country if they do cherish tolerance. Hence, currently, tolerance is not a priority.

The indifference of *haigui* entrepreneurs to tolerance in a place is worth noting. The possible explanation is that entrepreneurs behave differently with other members of the creative class, such as employees. Entrepreneurs see their role mainly as producers to maximize the return froms their human capital. It is doubtful whether economic benefits can be generated from tolerance. Even if the answer is yes, the mechanism has never been made unclear.

Based on the individual choice behavior perspective, this chapter tried to fit tolerance in the framework of utility. There are two possible ways how tolerance can affect the utility of a decision maker: as psychological comfort of learning about edged and cool stuff, or as catalyst which increases the probability to meet some random inspiring people. Neither of the above way affects *haigui* entrepreneurs, who put high priority on business success instead of learning about edged things, and who get to know people helpful for their business through social networks instead of some random ways.

Hence, entrepreneurs might choose to react to factors other than tolerance. Although a comparable analysis is absent because the discrete choice model of general *haigui* failed, the other analysis of the *haigui* stock offered partial evidence. Two out of three indices indicating place tolerance—population diversity and the bohemian index—appear to be influential in increasing the stock of *haigui*, although the length of openness was found to be irrelevant. It is more likely that general *haigui* talent look for more tolerant places, whereas *haigui* entrepreneurs do not care about tolerance. Despite the uncertain results from the comparison of different approaches, the primary evidence supports the idea that entrepreneurs do not behave the same as the rest of the creative class. There are two sides in the creative class:

employers and employees. People on both sides show different attitudes towards tolerance. Thus, mixing them would be problematic.

However, the unfinished *haigui* discrete choice analysis left doubts. Before we can fully reject the notion that employees are not attracted to tolerant places, there is still the possibility that the creative class theory is not applicable to developing countries like China. Further research is necessary to find conclusive evidence.

### ***Preferential policies***

This chapter also tests the hypothesis whether preferential policies attract *haigui* entrepreneurs to locate there. Astonishingly, results show that the answer is no. The coefficient of the index is negative although not significant. The variable describing preferential policies is represented by the number of start-up parks in a specific year. The non-significant results show that the mere construction of a park has little effect. There have been criticisms about government resources not being used effectively and that they are focused wrongly. Many start-up parks are no more than property management agencies. Government funds have been distributed evenly in same small amounts to eligible companies because there is not an effective method to screen the most potential of business plans and companies (Wang, 2010).

Lately, some developed coastal provinces have started to support potential business plans with greater effort instead of treating all qualified business plans equally. Local governments are racing to raise the maximum amount of funds to support new businesses.

For example, Wuxi city initiates a “530 plan” that offers *haigui* entrepreneurs 1 million CNY seed money, a 100 square meter office, a 100 square meters apartment, 3 million CNY venture capital (or more), and a guarantee for a commercial loan of 3 million CNY (or more). Hangzhou has initiated a “5050 plan” and offers *haigui* entrepreneurs a start-up subsidy up to 5 million CNY. Guangzhou has had a special fund of 200 million for “highly-qualified talents” every year since 2009 (高层次人

才专项扶持资金). *Haigui* entrepreneurs can receive a start-up subsidy up to 50 million CNY. Beijing and Shanghai offer less competitive preferential treatments. The subsidy is no more than 0.5 million CNY in Shanghai and 0.1 million CNY in Beijing. Even so, the two cities are still attracting most *haigui*-owned enterprises.

The amount of the local governments' subsidy is different on the city level. These governments made decisions to subsidize *haigui* entrepreneurs with local fiscal revenues. In addition to local support, national programs are available, such as "1000-expert plan", which offers a subsidy worth 1 million CNY (tax free).

This information also indicates a growing tendency to reward *haigui* peculiarly. Without restrictions on use, these subsidies virtually become personal wealth without being publicly debated. This process helps to attract a growing number of *haigui* talents to return, but on the other hand, severely damages social equity. Moreover, these kinds of policies are highly risky and are rarely effective. *Haigui* enterprises are cultivated mainly in a mature market environment. Favorable treatment would be more effective if it affected cost reduction and profit increase. Current policies, which were launched to increase the personal gains of entrepreneurs, might not attract rational entrepreneurs because they are more likely to consider the profitability of the enterprises in the long run. Contrary to the intention of the policy maker, those attracted by preferential measures might be most attractive to people from non-managerial positions. Some of them may be lured by the huge rewards and risk starting a business. They became inexperienced entrepreneurs later and might not be able to make the right locational choice for their firms. In other words, preferential policies might work for entrepreneurs with high success probability but lure inexperienced risk takers. In this case, the efficiency of the policy would be greatly weakened.

#### **4.2. Relationship between personal attributes and locational choice**

Personal characteristics of the returnee entrepreneurs were also found to affect

one's locational choices. By testing the effects of personal information, this study has empirically proved that different places tend to attract specific kinds of individuals. The way to observe impact of personal attributes requires comparing with a base, which was decided to be Shanghai in this analysis. All other provinces are compared with Shanghai. Here we draw two groups out to look at the detailed results. By testing the effects of personal information on locational choice, this study has for the first time empirically proved that different places tend to attract specific kinds of individuals.

The results show that *haigui* entrepreneurs with higher degrees are more willing to go to Jiangsu and “inland\_a” popular provinces and are less willing to go to Fujian.

Older *haigui* are more likely to go to Beijing, while younger ones are more likely to go to Tianjin and Jiangsu. To note here, the ranking of alternative nests are consistent with the rankings of the value of coefficients (the same below). In this case, since Tianjin is listed ahead of Jiangsu, it means the possibility that a *haigui* entrepreneurs going to Tianjin is larger than the same probability in Jiangsu.

Those who stayed abroad longer are less likely to go to “inland\_a” provinces, Beijing, Zhejiang, Shandong and Liaoning.

Those who had been to North America are less likely to go to “inland\_a” provinces, Fujian, Tianjin, Guangdong and the “inland\_b” provinces, Shandong and Zhejiang. Those returned from countries in Asia and Oceania are more likely to go to Fujian and Liaoning. *Haigui* back from European countries are also more likely to go to Liaoning.

Those who obtained a diploma abroad are less likely to go to Zhejiang. Those who have work experience in enterprises abroad tend to not go to the “inland\_a” provinces, Liaoning, Guangdong and the “inland\_b” provinces, Zhejiang, Tianjin, and Shandong.

To summarize, Beijing attracts those who are older and have stayed abroad for a shorter time. Shanghai obviously attracts *haigui* entrepreneurs returned from North

America and those who have work experience in foreign enterprises.

Fujian appears to be more attractive to *haigui* entrepreneurs returned from Asia and Oceania, specifically Japan and is not attractive to North America *haigui* entrepreneurs. Moreover, *haigui* entrepreneurs in Fujian appear to have a relatively low degrees (above bachelor, though).

### Comparing Beijing, Guangdong, and Shanghai

#### *Beijing vs. Shanghai:*

Degree -, Age +(\*\*), Time abroad -(\*\*\*); North America -, Asia & Oceania -, Europe +; Experience of foreign diploma +, Experience in enterprises abroad -, Experience in research institutes abroad +, Experience of starting up abroad +.

#### *Guangdong vs. Shanghai:*

Degree +, Age -, Time been abroad -; North America -(\*\*\*), Asia & Oceania +, Europe -; Experience of foreign diploma -, Experience in enterprises abroad -(\*\*\*), Experience in research institutes abroad +, Experience of starting up abroad +.

The results can be summarized as:

**Table 33. Comparison of Beijing, Guangdong and Shanghai**

Personal Attributes	Comparison results
Degree	Guangdong>Shanghai>Beijing
Age	Beijing» Shanghai>Guangdong
Time period being abroad	Shanghai» Beijing, Shanghai>Guangdong
Having stayed in North America	Shanghai>Beijing, Shanghai» Guangdong
Having stayed in Asia and Oceania	Guangdong>Shanghai>Beijing
Having stayed in Europe	Beijing>Shanghai>Guangdong
Experience of foreign diploma	Beijing>Shanghai>Guangdong
Experience in enterprises abroad	Shanghai>Beijing, Shanghai» Guangdong
Experience in research institutes abroad	Beijing>Shanghai, Guangdong>Shanghai
Experience of starting up abroad	Beijing>Shanghai, Guangdong>Shanghai

Note: only the mark “»” indicates a significant result. The mark “>” indicates a weak tendency, which is not statistically significant.

Beijing, Shanghai, and Guangdong are three of the most developed regions in

China, where the connection with international world is quite strong and favored by *haigui* entrepreneurs. It is necessary to examine them more closely to understand why the numbers of *haigui* entrepreneurs differ among these three provinces.

The results show that Beijing appears to attract older *haigui* and those who stayed abroad for shorter periods. Among the three provinces, Beijing *haigui* entrepreneurs hold the lowest degrees (not significant) but are more likely to have obtained a diploma abroad (also not significant). The shorter time abroad may indicate more social capital in China. Table 34 shows that among the three provinces, *haigui* entrepreneurs with social connections in Beijing are more likely to return to Beijing. Larger proportions of people think connections with Beijing as available resources. As the capital of China, Beijing has the advantage of political authority. People in Beijing can get closer to the country's policy makers and are more sensitive to the latest movements in their industries. Some are even invited to participate in setting standards for new industries. They can also obtain information more quickly if there is policy or financial support from the government. Being close to the political center has become a tacitly understood attraction among Beijing *haigui* entrepreneurs.

**Table 34. The utilization of social connections with Beijing, Shanghai, and Guangdong**

Province	Sampl es	birth place(bp)			worked place(wp)			studied place(sp)		
		bp	bp&cd <sup>[1]</sup>	(bp&cd)/bp%	wp	wp&cd	(wp&cd)/wp%	sp	sp&cd	(sp&cd)/sp%
Beijing	269	63	51	<b>81.0</b>	118	80	<b>67.8</b>	259	142	<b>54.8</b>
Shanghai	144	31	23	<b>74.2</b>	51	26	<b>51.0</b>	74	38	<b>51.4</b>
Guangdong	42	12	4	<b>33.3</b>	28	6	<b>21.4</b>	25	8	<b>32.0</b>

Note[1]: "rd"=the number of samples choosing the province in the first row as returned destination;

"bp"=the number of samples who was born in the province in the first row;

"wp"=the number of samples who had worked in the province in the first row

"sp"=the number of samples who had studied in universities in the province in the first row;

"bp&cd"= the number of samples who had the province in the first row as both birthplace and

chosen returned destination (abbreviated to “cd”). “wp&cd” and “sp&cd” follows the same naming principle.

Table 34 shows that *haigui* entrepreneurs tend to use their social relationships in Beijing if they have the resources. However, does this mean that Beijing is not attractive to people without connections there? The answer is no. Table 35 shows that of all Beijing *haigui* entrepreneurs, less than 20% were born there and less than 30% had worked there previously. However, over half had studied there. If we look at the other half, who had no study experience in Beijing, only 13% have social connections (9.3% had worked in Beijing; 4.8% were born there; 1.1% were born there and also had worked there). Only about 35% of *haigui* in Beijing are newcomers to the city and have no connections in Beijing. These data show that most *haigui* entrepreneurs attracted to Beijing had studied there previously.

The share of people with social connections is lower in Shanghai and Guangdong (see Table 35). Comparatively, *haigui* entrepreneurs in these two provinces rely less on social relationships than those in Beijing.

**Table 35. The share of *haigui* entrepreneurs with social connections**

Province	Samples	birth place(bp)		worked place(wp)		studied place(sp)	
		bp&cd <sup>[1]</sup>	(bp&cd)/samples %	wp&rd	(wp&cd)/samples %	sp&rd	(sp&cd)/samples %
Beijing	269	51	<b>19.0</b>	80	<b>29.7</b>	142	<b>52.8</b>
Shanghai	144	23	<b>16.0</b>	26	<b>18.1</b>	38	<b>26.4</b>
Guangdong	42	4	<b>9.5</b>	6	<b>14.3</b>	8	<b>19.0</b>

Note[1]: cd=the number of samples choosing the province in the first row as chosen returned destination

Compared with Beijing, fewer Shanghai *haigui* have social connections there (see Table 35), although social ties in Shanghai are still largely valued (see Table 34).



Regarding other personal information, Shanghai clearly attracts *haigui* returning from North America and those with work experience in enterprises abroad.

As China's financial center where the biggest stock exchange board in mainland China located (the other one is in Shenzhen), Shanghai has extended its influence to the international financial and business world. Thus, it has attracted many multinational companies to locate their headquarters there. These internationally active companies have hired many *haigui* employees. Therefore, compared with Beijing, Shanghai has a similar number of general *haigui* but much fewer *haigui* entrepreneurs. However, these companies also cultivate a market economy environment which is quite similar to that in the Western world. Therefore, *haigui* entrepreneurs, especially those back from the US where the spirit of entrepreneurship is vigorous and active, find a similar environment in Shanghai, such as effective management, less reliance on kinsmanship, more reliance on ability, and a more active capital market (i.e., more venture capital).

Among the three provinces, Guangdong has the most open business environment and the lowest dependence on social connections. As the entrance to the more open economy Hong Kong, Guangdong was the first mainland province to be influenced by the capitalist market. Many economic system reforms were initiated and tested in Guangdong before expanding to other provinces. For example, Guangdong was the first province to practice market supply instead of planned supply. Thus, Guangdong has cultivated a vibrant market economy with the least government intervention. As a result of this pursuit of "small government" administration, Guangdong has not offer systematic and intensive support policies as do other provinces. Consequently, *haigui* entrepreneurs have not favored Guangdong. Furthermore, although the active market economy in Guangdong has bred a large number of private enterprises, many of them highly capable of imitating products in the market. In reality, some even do not hesitate to do so. The requirements of intellectual property protection are not stringent in Guangdong and thus prevent high-tech entrepreneurs from locating there.

In addition, compared with Beijing and Shanghai, Guangdong has a weaker foundation of tertiary education. The universities are not as good and they are less numerous than in the other two cities. Thus, Guangdong may have sent fewer students abroad because former generations of students were restricted by going abroad at their own expense. At that time, only good universities have the networks and resources to send students abroad and there are less good universities in Guangdong, compared with Beijing and Shanghai. This fact has largely hampered the attraction of *haigui* entrepreneurs in Guangdong province.

The comparison among the three most developed coastal provinces highlights Beijing's attractiveness as a political center and higher-education center, with which the social connections are extremely valuable. Other provinces can hardly compete with it. This implies that government favorable treatments including investment and information need to be distributed more fairly.

### **Comparing inland provinces and Shanghai**

As demonstrated in the nested tree structure in Figure 14, inland provinces were divided into two nests, one is relatively popular (denoted by "inland\_a") and the other is unpopular (denoted by "inland\_b"). The results of comparing them with Shanghai were as follows.

The "inland\_a" provinces were found unattractive to *haigui* entrepreneurs with higher degrees, longer experience abroad, working experience in foreign enterprises, and those returned from North America. The "inland\_b" provinces were also found unattractive, especially to those who had resided in North America and those who had work experience abroad. There are no significant results showing the kinds of *haigui* entrepreneurs that are more likely to go to inland provinces. All significant evidence suggests they are not likely to locate in inland provinces, which implies that inland provinces have little advantage over Shanghai. The detailed results about each personal attributes are as follows.

*Inland\_a provinces vs. Shanghai:*

Degree +(\*\*\*), Age -, Time been abroad -(\*\*); North America -(\*\*), Asia & Oceania +, Europe +; Experience of foreign diploma +, Experience in enterprises abroad -(\*\*\*), Experience in research institutes abroad -, Experience of starting up abroad -.

*Inland\_b provinces vs. Shanghai*

Degree +, Age -, Time been abroad -; North America -(\*\*), Asia & Oceania -, Europe -; Experience of foreign diploma -, Experience in enterprises abroad -(\*\*\*), Experience in research institutes abroad +, Experience of starting up abroad -.

The results can be summarized as:

**Table 36. Comparison between inland provinces and Shanghai**

Personal Attributes	Comparison results
Degree	“inland_a”>> Shanghai, “inland_b”>Shanghai
Age	Shanghai>”inland_a”, Shanghai>”inland_b”
Time period being abroad	Shanghai>> ”inland_a”, Shanghai>“inland_b”
Having stayed in North America	Shanghai>> ”inland_a”, Shanghai>> ”inland_b”
Having stayed in Asia and Oceania	“inland_a”>Shanghai>“inland_b”
Having stayed in Europe	“inland_a”>Shanghai>“inland_b”
Experience of foreign diploma	“inland_a”>Shanghai>“inland_b”
Experience in enterprises abroad	Shanghai>> ”inland_a”, Shanghai>> ”inland_b”
Experience in research institutes abroad	“inland_b”>Shanghai>“inland_a”
Experience of starting up abroad	Shanghai>“inland_a”, Shanghai>“inland_b”

Note: only the mark “>>” indicates a significant relationship. The mark “>” indicates a weak tendency, which is not statistically significant.

“Inland\_a” provinces were found to be unattractive to the following *haigui* entrepreneurs: those with higher degrees, those who spent longer periods abroad, those who returned from North America, and those who worked in enterprises abroad. Instead, those with lower degrees, those returned from Asia, Oceania or Europe, and those with foreign diploma are more likely to go to these provinces (but not significant). Inland provinces still place a high emphasis on high degrees,

especially diplomas obtained abroad, while in Shanghai, ability is important. Hence, *haigui* with work experience in enterprises abroad find better career opportunities in Shanghai.

The remaining inland provinces have few *haigui* entrepreneurs. The results showed that these locations are not attractive to those returned from North America and those with work experience in enterprises abroad. Almost all personal information had a negative coefficient (not all significant), except experience in research institutes abroad (significant), and the degree (not significant). These results implied that people with higher degrees favor inland provinces over Shanghai. Among all the inland provinces, the difference between the “inland\_a” group and “inland\_b” group is that the former tends to attract those with work experience in research institutes abroad, while the latter attracts those with foreign diplomas (not significant). It remains a tough task for the remote inland provinces to attract *haigui* to found enterprises there. There is still a long way to go, but maybe they should start by giving fair assessments of *haigui* with ability, instead of screening them on high educational qualifications..

**Table 37-1. Collinearity diagnosis (1)**

	Pop ~di vers ity	Ope ne ss~	Tal ent	R& D~t	Inn ovat ion	Hig h-te ch	Pref eren tial ~	Cos t	Eco ~dy nam ics	Mar ket size	Infr astr uctu re	Cult ural ~	Me dica l~	Edu cati on~	Birt hpla ce	Stu died ~	Wo rked ~
Population Diversity	1.000																
Openness_length	0.244	1.000															
Talent	0.762	0.137	1.000														
R&D_investment	0.433	-0.053	0.402	1.000													
Innovation index	0.743	0.264	0.742	0.392	1.000												
High-tech index	0.659	0.186	0.529	0.707	0.572	1.000											
Preferential policy	0.551	0.334	0.537	0.310	0.670	0.447	1.000										
Cost	0.466	0.045	0.570	0.215	0.572	0.347	0.478	1.000									
Economic dynamics	0.384	-0.039	0.412	0.241	0.470	0.270	0.422	0.464	1.000								
Market size	0.364	0.647	0.309	0.252	0.447	0.221	0.549	0.434	0.165	1.000							
Infrastructure	0.500	0.398	0.547	0.263	0.699	0.420	0.583	0.563	0.335	0.606	1.000						
Cultural offerings	-0.131	-0.450	-0.121	-0.166	-0.085	0.028	-0.170	0.154	0.107	-0.505	-0.245	1.000					
Medical services	0.490	0.007	0.673	0.181	0.432	0.305	0.223	0.193	0.039	-0.042	0.164	0.142	1.000				
Education services	-0.134	-0.133	-0.083	-0.167	-0.210	-0.265	-0.209	-0.059	-0.090	-0.188	-0.045	0.069	-0.007	1.000			
Birthplace	0.065	0.038	0.058	0.057	0.054	0.061	0.080	0.013	0.016	0.075	0.050	-0.042	0.043	-0.036	1.000		
Studied-place	0.224	0.035	0.253	0.173	0.190	0.201	0.183	0.089	0.106	0.087	0.126	-0.047	0.196	-0.062	0.345	1.000	
Worked-place	0.175	0.038	0.187	0.133	0.159	0.160	0.120	0.072	0.089	0.064	0.107	-0.023	0.140	-0.043	0.254	0.376	1.000

**Table 37-2. Collinearity diagnosis (2)**

	Ln_age	Ln_time abroad	Degree	Life abroad	exp_dipl omoma	exp_entr eprise	exp_star tup	exp_rese arch	If_North America	If_Asia Oceania	If_Eur opo
Ln_age	1.000										
Ln_timeabroad	0.357	1.000									
Degree	0.290	0.306	1.000								
Life abroad	0.076	0.214	0.070	1.000							
exp_diplomoma	-0.040	0.335	0.191	0.005	1.000						
exp_entreprise	0.004	0.299	-0.034	0.004	0.068	1.000					
exp_startup	0.027	0.208	0.002	0.244	0.099	-0.070	1.000				
exp_research	0.181	0.152	0.359	0.058	-0.133	-0.321	-0.142	1.000			
If_NorthAmerica	0.051	0.256	0.052	0.146	0.014	0.143	0.128	0.066	1.000		
If_AsiaOceania	0.090	0.001	-0.037	-0.007	-0.046	-0.026	-0.058	-0.022	-0.454	1.000	
If_Europe	-0.064	-0.149	0.061	-0.069	0.035	-0.090	-0.082	-0.004	-0.484	-0.162	1.000

**Table 38. Regression results**

Place variables	Personal variables included																	
	Ln_age, Degree, Ln_timeabroad						If_NorthAmerica, If_AsiaOceania, If_Europe						exp_diploma, exp_enterprise, exp_startup, exp_research					
Population diversity	-	-					-	-					-	-				
Openness length	-						-(***)						-(***)					
talent			+						+(**)						+(*)			
R&D investment				+(**)						+(***)						+(***)		
Innovation index				-						-(*)						-		
High-tech index					+(***)						+(**)						+(**)	
Preferential policy						-						-(**)						-(**)
Cost	+	+(*)	+	+(*)	+	+(**)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(**)	+(***)	+(**)	+(***)
Economic dynamics	+(**)	+(***)	+(**)	+	+(**)	+(***)	+(**)	+(***)	+(**)	+	+(***)	+(***)	+(**)	+(***)	+(**)	+	+(***)	+(***)
Market size	+(*)	+(*)	+	+(**)	+(**)	+(**)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)
Infrastructure	-	-	-	-	-	+	+(*)	+(*)	+	+	+	+	+	+	+	+	+	+
Cultural offerings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Medical services	+(*)	+	+	+(*)	+	+(*)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)	+(***)
Educational services	+	+	+	+(*)	+(***)	+	+	+(*)	+(**)	+(**)	+(*)	+	+	+	+(*)	+	+(*)	+
VA assumption satisfied?								no	no	no	no	no		no	no	no	no	no

The collinearity is no larger than 0.7 and is considered acceptable.

## 5. Concluding Remarks

*Haigui* entrepreneurs have the following characteristics: mainly males in their 40s and early 50s with an average of 46.8; high degrees of education; an average of 10.3 years of experience abroad.

Their distribution inside the country is extremely uneven. The extent of concentration is stronger than that of the general *haigui*. Compared with 2003, the distribution of *haigui* entrepreneurs has changed slightly and dispersed a little.

Similar to the distribution pattern of general *haigui*, *haigui* entrepreneurs are concentrated in coastal developed provinces. Beijing and Shanghai have the most *haigui* entrepreneurs and Beijing exceeds Shanghai. However, for general *haigui*, the ratio of Shanghai to Beijing is 0.94, while for *haigui* entrepreneurs, the ratio is 0.53. *Haigui* entrepreneurs show a distinctive concentration in Beijing.

The locational choices of *haigui* entrepreneurs are affected in the following ways:

### (1) Creative milieu

Tolerance cannot be measured in the same way as it is in Western countries because of the lack of data. Tolerance that was measured in alternative ways, such as the share of population without local *hukou*, or the length of time since the first national development zone was established are not significantly affecting locational choices of *haigui* entrepreneurs. With these evidences generated from alternative tolerance indicators, it is difficult to reach a firm conclusion that tolerance does not affect *haigui* entrepreneurs' locational choices. However, combining the other evidence that social connections are highly attractive to *haigui* entrepreneurs, a tentative conclusion can be made that *haigui* entrepreneurs are not attracted to tolerant places, which usually feature loose social connections. This conclusion is important to guide the further studies on creative class, indicating the need to distinguish the employers from the employees of creative class. Together with the results from Chapter V, it is



suggested that creative class theory does not apply unconditionally for all the members. At least those with entrepreneurial creativity do not fit this theory. Researchers need to distinguish employers and employees in future research of creative class.

Talent power is not a decisive factor for *haigui* entrepreneurs and does not support the argument of “jobs follow people”.

Of the 3Ts in creative class theory, only technology power was found related to creative the locational choices of entrepreneurs. Moreover, technological output does not matter. Instead, R&D investment and an environment with well-established high-tech industry clusters attract *haigui* entrepreneurs.

#### (2) Economic factors

The locational choices of *haigui* entrepreneurs are largely affected by economic factors related to the success of enterprises, such as market size and economic dynamics. Policy makers should pay attention to this in designing incentive measures. Policies that raise the personal income of *haigui* entrepreneurs will work but will not be as effective as policies that reduce the cost of enterprises and increase their profitability. The latter will be more likely to attract rational entrepreneurs with higher potentials to succeed.

#### (3) Amenities

Good public services, including medical and basic educational services attract *haigui* entrepreneurs somewhat. However, these effects are not strongly significant. This result might be explained by the fact that more than 25% of *haigui* entrepreneurs still have connections abroad. They can access better public services in developed countries, so they may not mind locating where public services are poor. However, those who returned to China with the whole family do care about public services. Improving medical and education service levels possibly increase the attractiveness of a location.

The measure of art performance troupes showed that cultural offerings are not

attractive to *haigui* entrepreneurs.

#### (4) Social connections

Social connections are found to strongly affect the locational choices of *haigui* entrepreneurs. The types of places are ranked in the following order according to the magnitude of their effects: birthplace, place of work, place of study. Comparison among the three highly developed coastal provinces shows that social connections are most valuable in the capital of China, Beijing, while Shanghai comes next, and Guangdong the third.

In Beijing, over half of *haigui* entrepreneurs studied there. The powerful base of universities has benefited Beijing by providing a huge stock of *haigui* who are willing to make use of their social connections with the city. Also, in China's political center, information related to policy making and financial support might transfer faster in social networks. Access to such information is crucially valuable for entrepreneurs. Beijing's attractiveness as a political center and higher-education center is highlighted. Other provinces can hardly compete with it. This implies that government favorable treatments including investment and information need to be distributed more fairly.

(5) Inland provinces are not favored by most *haigui* entrepreneurs. The only obvious results are the tendency to attract *haigui* with high degrees or diplomas obtained overseas. However, in Shanghai, high degrees are not that important. As long as entrepreneurs have obtained a college degree, higher levels of education might not be that important for entrepreneurship. Thus, inland provinces need to reduce the emphasis on higher degrees. Instead of academic achievements, other abilities of *haigui* should be taken into account. Education used to be a relatively clear and simple criterion for city governors to screen qualified *haigui* entrepreneurs. Our suggestion in this chapter presents a challenge because it will make it more difficult to identify potential entrepreneurs with good business plans.

(6) The rush to establish start-up parks for *haigui* did not help regions to attract

*haigui* entrepreneurs. The reason might be that start-up parks are not functioning as expected. Most parks are no more than property management agencies although in recent years (after 2008), there has been a tendency to increase their subsidies. Whether this can identify entrepreneurs having the highest potential remains debatable and needs further observation. Furthermore, future research should examine other kinds of detailed preferential treatments. It is necessary to test the effects of specific preferential treatment on the locational choices of *haigui* entrepreneurs, so that precise policy suggestions can be made.

## References

- Abel, J. and Gabe T. (2010). Human capital and economic activity in urban America. *FRB of New York Staff Report*, No. 332.
- Available at: <http://ssrn.com/abstract=1161184> or <http://dx.doi.org/10.2139/ssrn.1161184>.
- Asheim, B. and Hansen, H. K. (2009). Knowledge bases, talents, and contexts: on the usefulness of the creative class approach in Sweden. *Economic Geography*, Vol.85, No.4: pp.425-42.
- Boschma, R. A. and Fritsch, M. (2009). Creative class and regional growth: empirical evidence from seven European countries. *Economic Geography*, Vol.85, No.4: pp.391-423.
- Cheng, S. (2007). Structure of firm location choices: an examination of Japanese greenfield investment in China. *Asian Economic Journal*, Vol.21, No.1: pp.47-73.
- Chinese Service Centre for Scholarly Exchange (CSCSE) of MOE, Torch High Technology Industry Development Centre of MOST and Technological Service center of Beijing Overseas Talents Center (BOTC) (various year). *Returned Chinese scholars pioneer yearbook*. Beijing: China Financial and Economic Publishing House. [Translated from Chinese, 教育部留学服务中心, 科技部火炬高技术产业开发中心, 北京海外学人科技服务中心编 (各年份) *中国留学人员创业年鉴*, 北京:中国财政经济出版社.]
- Clark, T. N., Lloyd, R., Wong, K. and Jain, P. (2002). Amenities drive urban growth. *Journal of Urban Affairs*, Vol.24, No.5: pp.493-515.
- Fan, Wei and Cai, Xuejun (2011). *The report on start-up environment for Chinese haigui*. Beijing: Peking University Press. [Translated from Chinese 范巍, 蔡学军(2011) *留学人员回国创业环境报告*. 北京:北京大学出版社.]
- Florida, R. L. (2002). *The rise of the creative class*. New York, NY: Basic Books.
- Florida, R. L., Mellander, C. and Qian, H. (2008a). Creative China? The university, tolerance, talent in Chinese regional development. *Working Paper. Stockholm*, Sweden, CESIS, Royal Institute of Technology.
- Florida, R. L., Mellander, C. and Stolarick, K. (2008b). Inside the black box of regional development: human capital, the creative class and tolerance. *Journal of Economic Geography*,

Vol.8, No.5: pp.615-649.

Florida, R. L., Mellander, C. and Adler, P. (2011). The creative class paradigm. In: Andersson, D. E., Andersson, A. E. and Mellander, C. (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.

Glaeser, E. L., Kolko J. and Saiz, A. (2001). Consumer city. *Journal of Economic Geography*, Vol.1, No.1: pp.27-50.

Hansen, H. K., Asheim, B. and Vang, J. (2009). Chapter 7 the European creative class and regional development: how relevant is Florida's theory for Europe? In: Kong, L. and O'Connor, J. (eds.) *Creative economies, creative cities: Asian-European perspectives*. Dordrecht/Heidelberg/London/New York: Springer.

Harris, C. D. (1954). The market as a factor in the localization of industry in the United States. *Annals of the Association of American Geographers*, Vol.44, No.4: pp.314-348.

Holcombe, R. G. (2011). Cultivating creativity: market creation of agglomeration economies. In: Andersson, D. E., Andersson, A. E. and Mellander, C. (eds.) *Handbook of creative cities*. Cheltenham, UK/Northampton, MA, US: Edward Elgar.

Kirzner, I. (1973). *Competition and entrepreneurship*. Chicago, IL: University of Chicago Press.

Markusen, A. (2006). Urban development and the politics of a creative class: evidence from a study of artists. *Environment and Planning*, Vol.38, No.10: pp.1921-1940.

Markusen, A. and Schrock, G. (2006). *Defining the cultural economy: Industry and occupational approaches*. the 53rd annual meeting at the North American Regional Science Association. Toronto.

Marlet, G., and Woerkens, C. (2004). Skills and creativity in a cross-section of Dutch cities. *Discussion Paper Series*, Vol.29: Utrecht School of Economics.

McGranahan, D. and Wojan, T. (2007). Recasting the creative class to examine growth processes in rural and urban countries. *Regional Studies*, Vol.41, No.2: pp.197-216.

Ministry of Science and Technology of China (MOST) (2011) *China science & technology statistics databook 2011*. Available at: <http://www.sts.org.cn/sjkl/kjtjdt/index.htm>

NBS (various year). *Statistical yearbook of China*. Beijing: China Statistics Press. [Translated

from Chinese 国家统计局(各年份). *中国统计年鉴*, 北京: 中国统计出版社. ]

NBS, National Development and Reform Commission of China (NDRC) and Ministry of Science and Technology of China (MOST) (various year). *China statistical yearbook on high technology industry* Beijing: China Statistics Press. [Translated from Chinese 国家统计局, 国家发展和改革委员会, 科学技术部编(各年份). *中国高科技产业统计年鉴*. 北京: 中国统计出版社. ]

Scott, A. J. (2006). Creative cities: conceptual issues and policy questions. *Journal of Urban Affairs*, Vol.28, No.1: pp.1-17.

Walker, R. and Lewis, R. (2001). Beyond the crabgrass frontier: industry and the spread of North American cities, 1850-1950. *Journal of Historical Geography*, Vol.27, No.1: pp.3-19.

Saxenian, A., (2006). *The New Argonauts: Regional Advantage in a Global Economy*. Cambridge, Massachusetts/London, England: Harvard University Press.

Wang, Huiyao (2010). *GEM promotes the SEMs' development*. Available at:

<http://www.ccg.org.cn/ccg/2010/0705/408.html>. [Translated from Chinese 王辉耀(2010) *创业板有助中小企业的发展*. 来自中国与全球化研究中心网站:

<http://www.ccg.org.cn/ccg/2010/0705/408.html>]

## Appendix Tables

**Table 39. Information source or estimation method of *haigui* in 2008 (by province)**

Province	$H_{2008}$	Estimation method or source
Beijing	80000	From Returned Chinese Scholars Pioneer Yearbook (2009)
Tianjin	5650 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Tianjin} / HE_{2003Shanghai})$
Hebei	3075 <sup>**</sup>	$= H_{2003Hebei} * growth\_rate\_2008\_to\_2003$
Shanxi	4000	From Returned Chinese Scholars Pioneer Yearbook (2009)
Inner Mongolia	2729 <sup>**</sup>	$= H_{2003InnerMongolia} * growth\_rate\_2008\_to\_2003$
Liaoning	24000	From Returned Chinese Scholars Pioneer Yearbook (2009)
Jilin	3439 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Jilin} / HE_{2003Shanghai})$
Heilongjiang	2391 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Heilongjiang} / HE_{2003Shanghai})$
Shanghai	75000	From Returned Chinese Scholars Pioneer Yearbook (2009)
Jiangsu	33690 <sup>*</sup>	$= H_{2007Jiangsu} * growth\_rate\_2008\_to\_2007$
Zhejiang	9646 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Zhejiang} / HE_{2003Shanghai})$
Anhui	4000	From Returned Chinese Scholars Pioneer Yearbook (2009)
Fujian	8200 <sup>**</sup>	$= H_{2003Fujian} * growth\_rate\_2008\_to\_2003$
Jiangxi	508 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Jiangxi} / HE_{2003Shanghai})$
Shandong	8984 <sup>*</sup>	$= H_{2007Shandong} * growth\_rate\_2008\_to\_2007$
Henan	1556 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Henan} / HE_{2003Shanghai})$
Hubei	5404 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Hubei} / HE_{2003Shanghai})$
Hunan	8200 <sup>**</sup>	$= H_{2003Hunan} * growth\_rate\_2008\_to\_2003$
Guangdong	22460 <sup>*</sup>	$= H_{2007Guangdong} * growth\_rate\_2008\_to\_2007$
Guangxi	1966 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Guangxi} / HE_{2003Shanghai})$
Hainan	387	From Returned Chinese Scholars Pioneer Yearbook (2009)
Chongqing	3369	From Returned Chinese Scholars Pioneer Yearbook (2009)
Sichuan	5330 <sup>**</sup>	$= H_{2003Sichuan} * growth\_rate\_2008\_to\_2003$
Guizhou	200	From Returned Chinese Scholars Pioneer Yearbook (2009)
Yunnan	1049 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Yunnan} / HE_{2003Shanghai})$
Tibet	N/A	
Shaanxi	6387 <sup>***</sup>	$= H_{2008Shanghai} * (HE_{2003Shaanxi} / HE_{2003Shanghai})$
Gansu	2050 <sup>**</sup>	$= H_{2003Gansu} * growth\_rate\_2008\_to\_2003$
Qinghai	200	From Returned Chinese Scholars Pioneer Yearbook (2009)
Ningxia	176	From Returned Chinese Scholars Pioneer Yearbook (2009)
Xinjiang	3690 <sup>**</sup>	$= H_{2003Xinjiang} * growth\_rate\_2008\_to\_2003$

Source: 2003 data is from the Exhibition of Chinese Returnees' Entrepreneurship Achievements (held at Beijing in 2004, by the PDC, MOP, MOE); data for 2007, 2008 are from Returned Chinese Scholars Pioneer Yearbook (2008, 2009).

Note (1): [n] represents data officially published data in major cities of the province.

Note (2): The estimation is done based on the following principles. The number in the latest year is of higher priority to be chosen as estimation base. Specifically, data in 2008 were firstly adopted, if it's not available, then estimation from 2007 will be used; for provinces still lack of data, estimation are made based on data in 2003.

(1) The numbers with superscript \* are estimated from the published data of 2007. It is already known that the growth rates of returnees in 2008 comparing to 2007 are as follows: Beijing = 1.103, Shanghai = 1.143, China (national wide) = 1.123. Then, the average 1.123 is used to calculate

(2) The numbers with superscript \*\* are estimated from the published data of 2003. It is already known that the growth rates of returnees in 2008 comparing to 2003 are as follows: average of provinces (with data available in both year) = 1.75, China (national wide) = 2.35. The mean value 2.05 is set as the growth value for the estimation.

(Beside, the number of Sichuan province is actually data in Chengdu city.)

(It is worth noting that Zhejiang's returnee number is 6150 after the 2 step's calculation, and turns out to be too low (especially comparing to its neighboring province Jiangsu). Thus the third step's result is adopted for Zhejiang provinces.)

(3) After step 1) and 2), there are some provinces lacking of data. The third step is to estimate the numbers for them according to their proportion to Beijing and Shanghai, using entrepreneur data in 2003. It is found out that these results are usually underestimated, comparing to provinces with data already known. So the relatively higher number (proportional to Shanghai's data) is adopted to complete the final dataset. The result numbers are noted with superscript \*\*\*.

Guizhou's data is calculated by none of the previous 3 ways. According to unofficial data source (<http://www.gyrc.com.cn/news/detail.asp?id=2675>), there are about 200 returnees in Guizhou and this number is adopted. Tibet's data is also missing after the aforementioned 3 steps were done. Since *haigui001* database does not include returnees who currently reside there either, it reflects the fact that Tibet is rarely chosen by the *haigui*. Thus, Tibet is dropped from the alternative set.



**Table 40. Information source or estimation method of *haigui* entrepreneurs in 2008 (by province)**

Province	$HE_{2008}$	Estimation method or source
Beijing	13443	From Returned Chinese Scholars Pioneer Yearbook (2009)
Tianjin	800	$=HE_{2003Tianjin} * H_{2008Tianjin} / H_{2003Tianjin}$
Hebei	142	$=HE_{2003Hebei} * H_{2008Hebei} / H_{2003Hebei}$
Shanxi	200	170= $H_{2007}$ in Taiyuan City; 233= $HE_{2003Shanxi} * H_{2009Shanxi} / H_{2003Shanxi}$ ; 200= $HC_{2009Shanxi} * (HE_{2003China} / HC_{2003China})$ < $HE_{2008Shanxi}$ is estimated to be 200 - the relatively smaller data estimated for year 2009.>
InnerMongolia	201	$=HE_{2007IM} + (HE_{2010IM} - HE_{2007IM}) / (2010 - 2007)$
Liaoning	2863	$=HC_{2008Liaoning} * (HE_{2003China} / HC_{2003China})$
Jilin	565	<proportional to Beijing> $= (HE_{2003Jilin} / HE_{2003Jilin}) * HE_{2008Beijing}$
Heilongjiang	393	<proportional to Beijing> $= (HE_{2003Heilongjiang} / HE_{2003Heilongjiang}) * HE_{2008Beijing}$
Shanghai	7158	$=HC_{2008Shanghai} * (HE_{2003China} / HC_{2003China})$
Jiangsu	1800	From <a href="http://news.eastday.com/m/20080703/u1a3691486.html">http://news.eastday.com/m/20080703/u1a3691486.html</a>
Zhejiang	1595	$=HC_{2008Zhejiang} * (HE_{2003China} / HC_{2003China})$
Anhui	547	$=HC_{2008Anhui} * (HE_{2003China} / HC_{2003China})$ <Underestimated, because $HC$ is limited to companies in science parks.>
Fujian	1613	$=HC_{2008Xiamen} * (HE_{2003China} / HC_{2003China})$ <Underestimated, because $HC$ is limited to companies in Xiamen. >
Jiangxi	135	$=HE_{2007Jiangxi} * H_{2008China} / H_{2007China}$
Shandong	1115	1076= $HE_{2008Shandong} * H_{2008China} / H_{2007China}$ 1115= $HC_{2007Shandong} * (HE_{2003China} / HC_{2003China})$ < $HE_{2008Shandong}$ is estimated to be 1115. >
Henan	255	<proportional to Beijing> $= (HE_{2003Henan} / HE_{2003Jilin}) * HE_{2008Beijing}$
Hubei	1100	From <a href="http://www.hbstd.gov.cn/html/2011_5_19_15_19_47_857.htm">http://www.hbstd.gov.cn/html/2011_5_19_15_19_47_857.htm</a>
Hunan	322	$=HE_{2003Hunan} * H_{2008Hunan} / H_{2003Hunan}$
Guangdong	2079	$=HE_{2003Guangdong} * H_{2008Guangdong} / H_{2003Guangdong}$
Guangxi	89	89 = $HE_{2008Guilin} + HE_{2008Nanning}$ From Returned Chinese Scholars Pioneer Yearbook (2009) <Underestimated>
Hainan	35	From Returned Chinese Scholars Pioneer Yearbook (2009)
Chongqing	90	From <a href="http://www.qalex.com/a/2009/68919-1.htm">http://www.qalex.com/a/2009/68919-1.htm</a>
Sichuan	463	$=HE_{2003Sichuan} * H_{2008Sichuan} / H_{2003Sichuan}$
Guizhou	N/A	
Yunnan	148	$=HC_{2008Yunnan} * (HE_{2003China} / HC_{2003China})$
Tibet	N/A	
Shaanxi	2000	From Returned Chinese Scholars Pioneer Yearbook (2009) <Underestimated. The data only includes Xi'an.>
Gansu	77	77= $HE_{2011Lanzhou}$ 111= $HE_{2003Gansu} * H_{2008Gansu} / H_{2003Gansu}$ . <77 is adopted.>
Qinghai	N/A	
Ningxia	34	From <a href="http://kfq.people.com.cn/GB/54918/55132/5803264.html">http://kfq.people.com.cn/GB/54918/55132/5803264.html</a> <Underestimated. The data only includes $HE$ in Ningxia until 2007.>
Xinjiang	50	From <a href="http://www.51ielts.com/c/2011-05-13/58602.html">http://www.51ielts.com/c/2011-05-13/58602.html</a>

Note:  $HE$  – the number of *haigui* entrepreneurs;  $H$  – the number of *haigui*;  $HC$  – the number

of *haigui* companies. Subscript 2003 and 2008 is used to indicate the year. The other subscript of province names is used to indicate the place.



## Chapter VI: Summary and Future Research

### 1. Summary

The broad objective of this thesis is to examine the influential factors of the locational choice behavior of Chinese talents. The phenomenon of the uneven distribution of talents is found on the country level as well as on the regional level. The unbalanced distribution is because of each individual's choice of location, by which he or she maximizes utility. Three literature strands were reviewed: the driving force of economic growth, the creative class, and influential factors in locational choices. The influential factors debated in the extant literature have focused mainly on economic factors, amenities, social connections, and the recently noticed creative milieu. What affects the locational choices of Chinese talents (including overseas Chinese and *haigui*)? The specific objectives of the thesis are as follows:

- (1) Review the situation of China's brain drain and reveal the influential factors in the return intentions of overseas Chinese talents.
- (2) Reveal the highly uneven distribution pattern of Chinese talents from the perspective of *haigui*. Find the reason for the distribution by studying individual choice behavior. The first research subjects are general *haigui* and then the objects are extended to include *haigui* entrepreneurs.
- (3) Test whether tolerance matters in China as it does in Western society.
- (4) Draw some conclusions and their policy implications for attracting talents and alleviating regional differences in place attractiveness to talents.

The thesis includes three main analyses, which focus separately on overseas

Chinese talents, general *haigui*, and *haigui* entrepreneurs. An empirical approach designed in two stages is employed in each analysis. The first step is to reveal the general picture through aggregate data. The general trends of international outflow and backflow of Chinese talents are reviewed. Despite the limited data source, this thesis managed to estimate the number of general *haigui* and *haigui* entrepreneurs in each province and reveal their distribution patterns.

The second step is individual-level analysis using discrete choice models. Seventy-three samples of overseas talents who are graduates of a top university in China were surveyed to study their choice of a country. Of the most notable *haigui* entrepreneurs, 798 were selected as samples to study their choice of province. The problem encountered in the analysis of general *haigui* is that the behavioral analysis of their choices of provinces failed due to insufficient data. As a solution, a linear regression was adopted instead.

The samples of this thesis are noteworthy. Not only do they belong to the highly educated group of talents who provide valuable human capital for the government but they also represent the best. The samples of overseas Chinese talents are graduates of a Chinese top university. The *haigui* entrepreneur samples are the most noted who are either very successful or highly potential to be successful. Both samples represent the people who are at the center of discussions on policies to attract talents. They attract the most intensive attention from the national government as well as local governments. Thus, the results of this thesis are used to provide the most valuable suggestions for policymakers.

Chapter III concerns locational choice at the national level. Overseas Chinese are less likely to return when they are older, have higher current incomes, and have integrated more with the local society. Interestingly, although a high current income reduces the intention to return, expected income differences between the host and home country do not affect decisions to return. Intention to return is higher if

someone considers living in China as more proximate to his or her spouse (or potential spouse), which is more common among younger people, both newly married and single. Families usually cannot afford the long absence and it is natural for them to want a family reunion. Moreover, the return-intention is greater in those who have emotional needs for social connections with friends and relatives.

Thus, the return-intention of overseas Chinese is not motivated by direct economic gains. Instead, it is a decision a person makes at a certain stage of life. Accompanying the economic development, China has seen a reduction in the income gap between it and developed countries, which helps to increase the potential to attract talents to return.

In Chapter IV, the analysis of general *haigui* shows that the stock of *haigui* is higher in economically developed areas. It is understandable that higher income attracts talents. However, income might not be the only reason because a high level of economic development is usually accompanied by better medical services and a more creative milieu. It is hard to separate the effects of a creative milieu from economic reasons to attract *haigui* talents. However, the influences of 3T indicators, *technology*, *talent*, and *tolerance*, were tested as substitute explanations of economic reasons. In the model testing 3T factors without economic variables, it was found that all three Ts - technology power, talent power, and tolerance - have strong effects on increasing the stock of *haigui*. Regarding technology power in particular, for general *haigui*, patents are more relevant than R&D investment or high-tech industry indices.

Chapter V concerns the locational choices of *haigui* entrepreneurs. It was found that *haigui* entrepreneurs tend to locate their enterprises where there is high technology power, a dynamic economy, a big market and where he or she has social connections with. Technology power refers to high R&D investment and a better ability to transfer the technologies into production, that is, a high share of high-tech

industries in the industrial structure. Interestingly, technology outputs, such as patents, were not attractive to *haigui* entrepreneurs. The results are more interesting when compared with those of general *haigui*, who, contrarily, are more attracted to patents than R&D investment or high-tech industry structure. These findings suggest that *haigui* entrepreneurs brought back technologies or ideas of their own when they returned, and they need support to continue R&D research and transfer it into marketable products.

The results showed that social connections matter to *haigui* entrepreneurs, and different types of connections were ranked in the following order: birthplace > work place > study place. Comparison among the three highly developed coastal provinces showed that social connections with Beijing are most valuable for *haigui* entrepreneurs. Shanghai is next, and in Guangdong the social connections appear the least valuable.

The above results made China an interesting case for testing creative class theory. The answers to the question “whether tolerance matters in China” lie in the findings related to tolerance as well as social connections.

Primary evidence has shown that the stock of general *haigui* increases in places with more tolerance, although whether tolerance affects individual choice behavior needs further testing. However, findings show that *haigui* entrepreneurs are not attracted to tolerant places when they make locational choices. Although the tolerance indicators is different from those utilize in Western studies, additional evidence that social connections affect *haigui* entrepreneurs further confirmed that tolerance does not matter. This observation does not align with Florida’s (2002) creative class theory because a society that relies on social networks is the opposite of a tolerant milieu. As the strongest result in this thesis, it suggests that talented people with entrepreneurial creativity behave differently from other members of the creative class. It would be a mistake to consider the employers and employees of the

creative class without distinguishing them. These findings will change future academic research on the creative class, reminding researchers to distinguish the members playing different roles in economic activities. The policy implication here is that implementing a tolerant strategy does not help a place to enhance high-tech industries or attract high-tech entrepreneurs.

Other implications for policy that emerge from this study concern attracting talents and hence reducing regional differences of talents attainments in China. Focusing on younger generations that have not yet settled in a host country will lead to more effective policies. Also, utilizing social networks through the associations of alumni or clansmen is an effective way to appeal to overseas Chinese talents. However, it is not easy to alleviate the huge differences among provinces. Inland provinces are disadvantaged in every aspect, from market size and industrial structure to social connections with talents. It is predictable that without proper government intervention, the situation will only become worse. However, the provinces have the potential to attract more *haigui* entrepreneurs by increasing R&D investments, enhancing higher education, and encouraging students to study abroad. At the same time, the governments of inland provinces need to overcome the preference for high degrees and be more open to screening potential business plans based on profitability.

## **2. Future Research**

There are several suggestions for future research:

(1) It is necessary to keep tracking the numbers of *haigui* and *haigui* entrepreneurs in each province, so that we can capture changes in their distribution pattern and determine the reasons for these changes.

(2) In this thesis, the choice sets of locations are defined as country and provinces.



Future research can be extended to a smaller spatial level in order to study the choice behaviors across cities.

(3) In the discussion of the creative milieu, the measurement of tolerance is not consistent with those in international academia because of data availability. It is important to use the gay index to measure the tolerance of a place and compare it with the research results of other countries.

(4) *Haigui* start-up parks require closer study. It is necessary to examine detailed preferential treatments for their efficiency. Their relationships with the locational choices of *haigui* entrepreneurs need to be determined so that policy suggestions can be more precise.

## References

Florida, R. L. (2002). *The rise of the creative class*. New York, NY: Basic Books.

## Abbreviations

- BOTC: Beijing Overseas Talents Center, 北京海外学人中心
- CADZ: China Association of Development Zones, 中国开发区协会
- CPC: Communist Party of China, 中国共产党
- CSCSE: Chinese Service Centre for Scholarly Exchange (of MOE), 中国(教育部)留学服务中心
- CSY: China Statistical Yearbook, 中国统计年鉴
- DCMAS: Department of Culture, Media and Sport of UK
- GSMC: Grace Semiconductor Manufacturing Corporation, 宏力半导体
- MOE: the Ministry of Education of China, 中国教育部
- MOP: the Ministry of Personnel of China, 中国人事部
- MOST: the Ministry of Science and Technology of China, 中国科学技术部
- MPS: the Ministry of Public Security of China, 中国公安部
- NBS: National Bureau of Statistics of China, 国家统计局
- NDRC: National Development and Reform Commission of China 中国国家发展和改革委员会
- PDC: Propaganda Department of the CPC Central Committee, 中共中央宣传部
- PSB: Public Security Bureau, 公安局
- SMIC: Semiconductor Manufacturing International Corporation, 中芯国际
- WIPO: World Intellectual Property Organization