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## **The underdogs of the Chinese labor market**

*- a Minor Field Study on whether reasons behind the intention to emigrate differ across social groups*

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**Abstract.** Nepotism is argued to asymmetrically channel the labor market information in China. This results in a system where networks and personal connections becomes more important than skills and individual achievements, causing discrimination in job search and eventually increased inequalities. Established social networks is essential for an individual's probability of securing a job and it is particularly important among younger workers. Recent anti-graft policies, established by the Communist Party of China (the CCP), aim to terminate such discrimination and consequently decrease the immense outflow of skilled workers that has been characterizing China for decades. So far, these efforts have had limited success. This study investigates whether reasons behind the intention to emigrate differ across social groups and aims to provide a foundation for future research on how the CCP could potentially improve its anti-graft policies by targeting these differences more efficiently. The results conclusively indicate that there is a difference in the intention to emigrate across socioeconomic groups, but whether the reasons behind the intentions differ is yet to be discovered.

**Keywords:** International migration, Public policy, Planning Policy, Human capital, China

**JEL:** F22, J24, J18, O15, O21

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## Introduction

The Chinese society is characterized by a hierarchical order where personal ties and established connections form the fundamental layer of an individual's professional prospects. In other words, the institutional structure of the Chinese society facilitates and encourages the reliance on social networks, *guanxi* (Gold, Guthrie and Wank, 2002), meaning that the success in one's career may depend on whom one knows rather than how well one performs. This is argued to cause discrimination in job search and eventually increased inequalities (Zhang, 2003).

Connected with this discussion, is the debate on how China should work to lift their large middle-income population up the income ladder, and thereby avoid the middle-income trap. After the destruction of academic institutions during Mao's ruling, immense efforts have been made by the Chinese government to develop the education system in the country. The objective has been to form a new generation of highly skilled Chinese workers, that would further push the economy forward in order to avoid the middle income trap<sup>1</sup>. Though the Chinese universities recruit students on the basis of academic results, the reliance on *guanxi* on the job market makes it difficult for students from lower social groups to achieve attractive jobs. The government's efforts to improve the education system and increase the educated share of the population is undermined by these institutional characteristics that eliminate the incentives for lower class Chinese to invest in their education, or create incentives to emigrate in search for better opportunities.

China has long been recognized as one of the countries suffering from the worst brain drain in the world. In 2013, UN-DESA and OECD<sup>2</sup> (2013) reported that China exports one fifth of the world's tertiary educated<sup>3</sup> migrants. 1.7 million out of the country's total 3.8 million emigrants have received tertiary education, corresponding to the second largest outflow of educated emigrants in the world. Constituting such a large fraction of the world's total skilled migration, China is a central actor within the discussion on human capital flows. A core aspect in China's most recent efforts to decrease the emigration outflow has been to fight nepotism, or social networks, that limit equal possibilities to enter the job market. In April 2016, the anti-graft campaign that was initiated by Xi Jinping was expanded to end the nepotism by, for

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<sup>1</sup> The middle income trap refers to a situation whereby a middle income country, fails to lift its income to that of a high income country.

<sup>2</sup> UN-DESA (United Nations Department of Economics and Social Affairs) and OECD (The Organisation of Economic Cooperation and Development).

<sup>3</sup> Tertiary education broadly refers to all post-secondary education including, but not limited to, universities. It also accounts for colleges, technical training institutes, community colleges, nursing schools, research laboratories, and centers of excellence.

example, prohibiting officials to include relatives rather than the most skilled into state-owned enterprises (Jia, 2016).

If the brain drain is not efficiently reversed, China will lose a huge amount of potential and currently skilled human capital that could otherwise contribute to the country's economic development.

With China as a benchmark, the purpose of this investigating study is to provide new insights on the link between *socio-economic background* of individuals and the *reasons* that drive their *intention* to emigrate. While there is an abundant mass of literature regarding drivers of actual migration<sup>4</sup> and its patterns, as well as, migration intentions and their underlying reasons, we have not been able to find any literature outlining whether these reasons varies across a country's social groups. With this paper, we wish to bridge this gap. Studying how these reasons vary across social groups, there are potentially interesting socio-economic insights to gain for China's future efforts on developing their human capital stock.

Applying econometrics, we find a method for such an analysis and shape a framework for understanding these socio-economic drivers. If we find differing reasons behind the intentions to emigrate across social groups, there could be strong reason to further examine these differences on a bigger scale in order for China to effectively target their human capital retaining policies toward specific social groups.

This paper is organized as follows. We begin with providing a description of the background of the emigration situation in China, including current drivers of emigration. We proceed with outlining existing research. Next, we define our research question and present a framework that facilitates our study. This is followed by a presentation of the results from econometric analysis and inferences. Thereafter, we discuss relevant insight to our study question and limitations. Finally, we provide concluding remarks and our view on implications for future research.

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<sup>4</sup> We have chosen a terminology that differs between migration and emigration. We use the term migration (incl emigration) when focusing on human capital movements in general, while we use the term emigration when the outflow of human capital is in specific focus.

## Background

The development and effective allocation of a country's skilled workforce is critical to the country's long-term growth. With an increasingly globalized world, with populations floating across borders, scientists have recognized the potentially negative side of one-direction labor movements where intellectuals leave less developed countries for more developed markets to pursue their careers.

This downside of the global labor flows, brain-drain, was mentioned by Grubel and Scott already in the late 1960s (Grubel and Scott, 1966), and is still a hotly debated topic. Brain drain occurs and becomes an issue when a disproportionate fraction of a country's total emigrants is highly skilled, creating a loss of educated human capital in the home country.

The importance of studying these issues in China comes from the immense number of skilled people leaving the country in search for better lives elsewhere. The Communist Party of China (the CCP) has recently established different programs and policies for retaining human capital in China.

The Chinese government and its institutions also actively engage in attracting their overseas population. Zweig (2006) lists and discusses the most impactful and important of these programs and policies introduced by the Ministry of Education and the Chinese Academy of Sciences (see **Appendix 1**).

However, the efforts have seen limited success. This is partly due to failure in implementation, resulting in the perception of non credible promises from the government. Also, though these efforts should work theoretically, there is a risk of inefficient targeting if the CCP fails to fully address the underlying reasons for the decision to emigrate or stay abroad. An example of this could be constructing policies that target the population homogeneously rather than recognizing differences across social groups. Studying how these reasons vary with social background, there are potentially interesting socio-economic insights to gain for China's future efforts in developing their human capital stock.

## A historical approach on brain drain in China

After the mass destruction of Chinese academic institutions during Mao's ruling in the 1970s, Chinese leaders made it their strategy to encourage Chinese scholars to study overseas. The goal was to utilize foreign institutions for training a new generation of highly skilled Chinese workers, with the hope of seeing them return with valuable knowledge, foreign perspectives and ideas that would help fuel the country's business and academic communities. At first, the strategy seemed effective and many overseas Chinese returned to their home country. But in the 1980s, this fraction started to decrease and after the military assault on the Tiananmen Square on June 4th, 1989, on student-led demonstrations calling for more individual rights and political freedom, the Chinese brain drain became a pronounced phenomenon. The outflow of skilled human capital further escalated when Western governments responded to the

military assault by extending Chinese students' and scholars' permission to stay in their respective host countries (Zweig, 1997)<sup>5</sup>.

Today, China's level of brain drain corresponds to the second largest emigration of skilled workers in the world. The CCP have introduced policies and programs to bring back Chinese scholars and professionals abroad, and also to stimulate the intention to return for students that have not yet emigrated. Despite this, these efforts have had limited success. An estimated 1.7 million Chinese emigrants, out of a total of 3.8 million, have received tertiary education, implying a significant loss in human capital for the country and its economic development (OECD-UNDESA, 2013). **Table 1** shows the number of cumulative totals of Chinese students overseas and those returning to China (Cao, 2008).

Table 1.

Cumulative totals of Chinese students overseas and back in China each year, 1985–2007.

| Year | Total number of students overseas | Total number of students returned | Ratio of returnees to total Chinese overseas in year (%) |
|------|-----------------------------------|-----------------------------------|----------------------------------------------------------|
| 1985 | 40,000                            | 16,500                            | 41.25                                                    |
| 1986 | 40,000                            | 17,000                            | 42.50                                                    |
| 1987 | 64,000                            | 22,000                            | 34.38                                                    |
| 1988 | 70,000                            | n.a.                              | n.a.                                                     |
| 1989 | 80,000                            | 33,000                            | 41.25                                                    |
| 1990 | n.a.                              | n.a.                              | n.a.                                                     |
| 1991 | 170,000                           | 50,000                            | 29.41                                                    |
| 1992 | 190,000                           | 60,000                            | 31.58                                                    |
| 1993 | 210,000                           | 70,000                            | 33.33                                                    |
| 1994 | 230,000                           | 75,000                            | 32.61                                                    |
| 1995 | 250,000                           | 81,000                            | 32.40                                                    |
| 1996 | 270,000                           | 90,000                            | 33.33                                                    |
| 1997 | 300,000                           | 96,000                            | 32.00                                                    |
| 1998 | 300,000                           | 100,000                           | 33.33                                                    |
| 1999 | 320,000                           | 110,000                           | 34.38                                                    |
| 2000 | 340,000                           | 140,000                           | 41.18                                                    |
| 2001 | 420,000                           | 140,000                           | 33.33                                                    |
| 2002 | 583,000                           | 153,000                           | 26.24                                                    |
| 2003 | 700,200                           | 172,800                           | 24.68                                                    |
| 2004 | 815,000                           | 198,000                           | 24.29                                                    |
| 2005 | 933,400                           | 232,900                           | 24.95                                                    |
| 2006 | 1,067,000                         | 275,000                           | 25.77                                                    |
| 2007 | 1,211,700                         | 319,700                           | 26.38                                                    |

These low numbers of returnees clearly indicate the importance for the Chinese government to establish more effective policies to regain as well as retain its intellectuals in order to turn the country into an

<sup>5</sup> Over 50,000 Chinese students and scholars became permanent residents of the United States; over 10,000 secured working rights in Canada; and in Australia, over 20,000 Chinese students were accorded an opportunity to stay, although the longevity of that commitment is in some doubt (Zweig, 1997).

innovation-oriented society rather than just a manufacturing-society and thus further improve the economical development and sustainability in the country.

## Rapid economic development & innovation as a crucial factor for future growth

Ever since the 1980's China has seen a rapid growth in GDP. This rapid pace in economic development was fuelled by a range of political reforms under the rule of Deng Xiaoping. For example, one of the most impactful decisions was the establishment of economic zones, such as the city Shenzhen in southern China. The economic boom has led to improved lives for millions of Chinese citizens. The country's GDP has reached USD 1.3 trillion (2014), and with its 1.3 billion population, it has become the second largest economy in the world. However, China is still recognized as a developing country with a per capita income only a fraction of that in advanced countries. Furthermore, the economic growth has seen stagnation during the last years. This has fuelled a hot debate on the many internal issues related to the rapid growth, that lie before China<sup>6</sup>. The issues that China is facing are, for example, inequality, internal labor movements (mass-urbanization), and difficulties in moving the middle-class further up the income ladder, and thereby escaping the middle income trap<sup>7</sup> (Shahid, 2011). Avoiding this trap, is said to be hindered by heavy corruption in corporate environments as an obstacle to efficient innovation in enterprises, corruptive politics and constraints in the academic world. Further, China is recognized for its efficient manufacturing industries that has contributed heavily to the rapid development and increase in GDP. However, the country has yet not managed to compete with developed countries in industries demanding innovation and creativity. This is argued to be a key reason behind the stagnation of the economy. While the main driver for a manufacturing economy is the size of its labor force, the crucial component for a more innovative economy is skills and an educated population. That is, as long as China fails to retain its human capital and decrease the outflow of skilled workers there are reasons to believe that China will face challenges in becoming an economy characterized by innovation.

Another aspect of economic development is that while a country grows richer, its citizens will change their perceptions of the future potential of living in the country. According to a study in 1996, an individual's perception of the future economic stability in China had a significant effect on the decision to go abroad or to stay in China. People having a strong belief in a future economic growth were more prone to stay in China or, in the case that they had studied or worked abroad for a short amount of time, return to their home country (Cao, 2009).

## The importance of guanxi in China and its characteristics

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<sup>6</sup> The growth target in the 12th five-year plan (2011-2015) was 7 percent, while the growth target in the 13th five-year plan (2016-2020) is 6.5 percent.

<sup>7</sup> The middle income trap refers to a situation whereby a middle income country, fails to lift its income to that of a high income country.

Guanxi is argued to play a significant role in channeling labor market information and underpinning nepotism, and also to victimize those who do not possess it. That is, the access to guanxi is essential for an individual's probability of securing a job and is particularly important among younger workers (Zhang, Xiaobo and Li, Guo. 2003). The concept, Guanxi, is a complex phenomenon within the Chinese socio-economic life, and up until date scholars are still having difficulties in explaining the word in its complete meaning with all the nuances conjured in the the word. A simple translation of guanxi is *personal ties* or *relationship*, and in a broader meaning referred to as social networks. (So, Ying Lun and Walker, Anthony. 2006). However, a one sentence translation of guanxi is not in any way enough to describe its rich meaning, why the Mandarin term “guanxi” is usually kept in English text and literature. Its importance in the business world is widely recognized by Chinese, as well as overseas, businessmen operating in Chinese business communities. In a study made by Li and Li (2000), they argue that in most business practices, China can be described as a relation-based economy rather than a rule-based economy. Further, Yang (1994) points out that when some members in a society are given an opportunity through guanxi, others without guanxi will be excluded, and once this culture is established, people will have strong incentives to cultivate and utilize guanxi. This results in a system where networks and personal connections becomes more important than skills and individual achievements, causing discrimination in job search and eventually increased inequalities. That is, once an attractive top position on the labor market in China is open, it is most likely to to be filled with someone from the same social group as, and personal connections to, the previous employed, causing difficulties for skilled workers from lower social groups that are lacking guanxi to advance on the labor market and thus climb the income ladder. For our paper, understanding the basics of guanxi is essential since it represent a likely foundation for differing reasons behind intentions to emigrate across social groups.

## Competitive education in China

An often mentioned incentive to emigrate from China is the poor quality of Chinese universities. After the chaos that ravaged the country following the Cultural Revolution, it was not until 1978 that China started building meaningful institutions in order to educate a competitive workforce (Burell, 2001). After many efforts that showed little results, project 985 was launched in 1998. It was the heaviest investment in Chinese academics throughout history, and was initiated by the Chinese government led by president Zhang Zeming, to strengthen the pool of academic institutions in China, and create possibilities for long-term socio and economic development. 39 universities were chosen to have improvements in education, scientific research, management and institutional efficiency (China Education Center Ltd, 2016). Despite these efforts, only four Chinese universities are placed among the world's top 100<sup>8</sup>, as of

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<sup>8</sup> Tsinghua University (25th), Peking University (41st), Fudan University (51st), Shanghai Jiao Tong University (71st). Looking at university rankings, we chose between the three most recognized ranking associations. The one we chose, *QS World University Rankings*, was the British ranking. We deliberately chose not to look at rankings from the USA and China, in order to avoid bias resulting from competition for students between China and the USA.

2016 (QS World Ranking, 2015/16). Without sufficient institutions for higher education, a core strategy to China's endeavors in trying to educate its population has been to send its brightest students to study abroad (Cao, 2008).

Also on an individual level, the scarcity of high quality academic institutions creates incentives to study abroad. Resulting from the one child policy, all financial resources in a household can be directed to the only child. Despite expensive tuitions, the previous luxury of sending children to study abroad is no longer limited to the upper class Chinese<sup>9</sup>. Chinese students seek their way to foreign schools in order to gain a competitive edge for future employment. Regardless of socioeconomic background, this can be assumed to be advantageous for all students when competing for attractive jobs. However, it becomes an even more critical merit for those who come from lower social groups and therefore lack *guanxi*.

## The Chinese labor market

Even though the families that send their children abroad are more evenly distributed across social groups today, the problem arises when the students return to China. The labor market in China, as well as the society itself, is characterized by a hierarchical atmosphere and a great importance of *guanxi*, where the success in a career may depend on whom one knows rather than how well one performs. Hence, the problem with corruption on the labor market, and the crucial need for a professional network of established relationships, causes competent people with lack of *guanxi* to stay abroad. Also, difficulties in entering the labor market reduce incentives to pursue higher education in the first place. This happens when students who belong to lower social groups believe that they will not be able to achieve attractive jobs, regardless of academic degree. Just as with skilled emigration, this undermines the CCP's efforts to increase the quality of China's academic institutions and results in a loss of human capital.

## Political environment

China is a communist dictatorship, with CCP as the ruling party. Practicing constraints on the freedom to speak, and censoring media and press releases from the vast number of state owned enterprises, they have a monopoly on political power, and corruption is embodied in the way it controls the country. Only through the CCP can a person be politically active (Brown, 2013). That is, even within the political environment it is crucial with a pronounced personal network in order to be included in a certain group. After the Tiananmen square massacre in 1989, most people cited political anger and hostility against the Chinese government as the key reason for not returning to China. In a qualitative and quantitative study performed by Daniel Zweig (1997), 43.7% of the respondents expressed political instability as their main reason for not returning to China. The respondents emphasized the desire for political freedom, fears of political instability, lack of trust in the government, and the political campaigns of the past years as important factors that influence people's intentions to stay abroad.

## Previous Research

In order to better understand the reasons behind the intention to emigrate, and thus being able to form an analytical framework for our study, this chapter reviews fundamental insights that are offered from previous research. In order to map possible differences in reasons behind the intentions across social groups, we recognize the causes of migration as the most essential to understand. In line with existing literature, we thus make a distinction between the *impact* of migration for sending and receiving societies, and the *causes* of migration (Massey et al. 1998), where we limit our research to the latter.

Firstly, we look at the term *human capital*, where we recognize the future promise of profit that investing in human capital gives. This is consistent with the relevance of this study, that partly lies in the current need for improved human capital retention efforts in China. We will thus use Scott's (1966) definition of formally enhanced human capital, where human capital is seen as an asset embodied in human beings that, just as physical output, yields a flow of output.

This section is outlined as follows. Firstly, we map previous research on the drivers of migration. Secondly, we turn to *push-pull models* and the *neoclassical migration theory* to shape an analytical framework for this study. Lastly we look at international policies and interventions that affect the Chinese emigration.

## Historical approach on research and migration models

One of the first contributions to the migration literature are two articles by the nineteenth-century geographer, Ravenstein, in which he states that migration is an inseparable part of development and that the major cause for migration is economic (1885; 1889). The idea that migration is a function of spatial disequilibria constitutes the cornerstone assumption of so-called gravity models, and was further developed during the 1990 by, among others, Lee (push-pull model) and Harris & Todaro (neoclassical migration theories)<sup>10</sup>. Though both push-pull models and neoclassical theories have been criticized for simplifying the causes of migration, they present a framework of assumptions that are useful for the purpose of our survey.

### *Push-pull models: Outlining drivers of migration*

Everett S. Lee (1966) reformulated Ravenstein's work and contributed to the migration literature with the article "A Theory of Migration", in which he presents his push-pull model. In this model, he argues that there are four different factors intervening into the decision-making of migrating; factors associated with the area of origin, factors associated with the area of destination, intervening obstacles and personal

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<sup>10</sup> Gravity models are also called functional social theories.

factors.<sup>11</sup> Within each area there are factors that act to retain/attract people within/to the area but there are also factors that repel them, called 'plus' and 'minus' factors (Lee,1966). These factors affect prospective migrants individually and hence their decision whether to emigrate or to stay. Generally speaking, push-pull models identify and incorporate all major factors regarding environmental, economical and demographical elements that push people out of their place of origin and pull them into destination places (Castles, Haas and Miller 2014). Though all these factors play an important role in explaining the reasons behind people's decisions to emigrate, it reflects only a limited understanding of the causes of migration. The model has been widely debated and argued to be purely descriptive and misleading in its nature of listing different factors that can contribute to migration, but without the ability of bringing them together in an explanatory system (Skeldon, 1990). Push-pull models also lack the ability of building a framework for understanding the consequences of migration and how it affects both the country of origin and destination.

Despite the disadvantages that Lee's push-pull model has been criticized for, we consider it to be useful as a foundation for our survey. The model is particularly suitable for our study because of its simplified approach on migration, where it lists the causes of migration rather than impacts. Subsequently, its criticism does not affect our results since the effect of migration is not included in the scope of this paper. Further, for the same reasoning we choose to exclude the part of the model covering intervening obstacles. With the push-pull framework, we shape a fundamental structure of current factors that drive the intention to emigrate among Chinese students. We thereafter apply the neoclassical approach to detect the differences in expected return from leaving China. Identifying the primary reasons behind students' intentions to emigrate helps us measure these drivers for individuals with differing socioeconomic backgrounds.

### *Neoclassical migration theory: Modelling expected return for emigrating*

While still relying on the assumption that social forces gravitate towards equilibrium, the neoclassical theories present a slightly different approach on migration<sup>12</sup>. Neoclassical migration theory recognizes migration as a function of the geographical difference in the supply and demand of labor. This results in wage differentials which in turn encourage workers to move from low-wage, labor-surplus regions to high-wealth, labor-scarce regions (Castles, Haas and Miller, 2014). From a micro perspective, the decision to emigrate is analyzed as an individual decision-making process where the individual is assumed to be rational and to go where they are able to maximize their productivity and consequently earn the highest wage. A prospective migrant with certain characteristics and set of skills will weigh migration cost and

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<sup>11</sup> Intervening obstacles include distance, physical barriers, immigration laws and affect people in different ways.

<sup>12</sup> Social forces: Population size, economic opportunities, distance etc.

expected gains of staying, against expected costs and gains in the country of destination (Massey 1993, Hatton and Williams et al. 1998). At a macro-level, the neoclassical approach views migration as a process in which the allocation of production factors are optimized through continued migration until an equilibrium has been reached between the sending and destination area. As wages converge, inequalities between receiving regions and places of origin will diminish, lowering the incentives for migration (Harris and Todaro, 1970). Sjaastad's (1962) contribution to the literature on migration provides an approach that helps explain the selectivity of migration. People vary in terms of personal skills, knowledge, physical abilities, age and gender, so there will also be differences in the extent to which they can expect to gain from migrating (Castles, De Haas and Miller, 2014). This implies that individuals with different backgrounds will have different intentions to emigrate.

Some research on neoclassical migration theory stress the importance and influence of the migrant's family and claim that the decision to migrate comes from the whole family, following a strategy of risk diversification (Stark and Blom 1985, Stark 1991). However, we will limit our research to the micro perspective of migration, where the decision is individualistic. This despite the Chinese society being one of Confucian believes, where the parents in the family traditionally have a lot to say about the future of their children (Dutton, 1992). Also, Chinese parents finance much of their Children's education. It is therefore likely that they, in fact, have influence on their children's intention to emigrate. Another aspect that affects this study in specific, is that it is not unlikely that the influence parents have on their children could differ across social groups. What motivates our assumption is that the students in our sample live at the university campus and we can therefore assume that their major sources of influence derive from their surrounding environment, rather than their families. Also, assuming individual decision-making, allows us to discuss migration from a neoclassical perspective where the students seek to maximize their own utility, which facilitates the formulation of our survey and econometric analysis. We thus exclude the probability that parents affect the reasoning behind potential emigration. The effects this might have on our results is something we will take into consideration when drawing conclusions about our model. We will discuss this limitation and its implication for the results later in this paper.

An important aspect to keep in mind, is that the scope of this paper is limited to the intention to emigrate rather than realized emigration and that our sample population, to our knowledge, has yet not expressed real intentions to emigrate. This implies that we are constructing a hypothetical scenario for our respondents, which is likely to affect our results due to a divergence between top-of-mind reasons in a hypothetical, compared to a well-reasoned and actual emigration scenario. This approach further strengthens above assumption of individual and rational decision making since top-of-mind reasons can be assumed to reflect individual preferences.

## International policies fueling Chinese skilled emigration

The increasing number of international migrants put enormous pressure on both national as well as transnational governance across the world. In order to counteract the immense amount of low skilled immigration that has been characterizing some areas of destination recently, many of the most common receiving countries in the world have tightened their immigration policies and implemented policies that instead work to attract more skilled workers<sup>13</sup>. For example, Europe has experienced a tremendous increase in the fraction of low skilled immigrants during the past decade due to political instability in neighboring areas. In order to offset this trend, the European Commission adopted a proposal of creating the 'EU Blue Card' in 2007, which aims to facilitate for highly skilled workers to get a job within EU (European Commission, 2007). For China, being the world's second largest exporter of skilled human capital (OECD-UNDESA, 2013), such regulations increase the incentives for Chinese intellectuals to go abroad in search for better job opportunities with higher returns to their skills. While receiving countries may introduce harder policies in order to decrease low skilled immigration and instead attract high skilled migrants, there are hardly any ways for sending countries to restrict emigration. In order for China to retain its human capital stock and prevent further selective emigration, fuelled by international policies, that may result in continuing brain drain, policies that target the reasons behind intentions to emigrate are of great importance.

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<sup>13</sup> In 2015, two-thirds (67 per cent) of all international migrants were living in just 20 countries. The largest number of international migrants (47 million) resides in the United States of America, equal to about a fifth (19 per cent) of the world's total. Germany and the Russian Federation host the second and third largest numbers of migrants worldwide (12 million each).

## Research Design

### Research question

There is a lack of research covering the link between socioeconomic background and reasons behind the intention to emigrate. We have seen a potential relationship between social background and some of the most frequently mentioned drivers of brain-drain; economic stability/development, labor market, academic institutions, and political environment. Also, the neoclassical approach suggests that there are differences in expected gains and costs from migrating depending on an individual's background. Relating this to our study, this could indicate that people would have different reasons to emigrate, across socioeconomic groups. Following above reasoning, we seek to investigate below research question:

***The underlying reasons behind the intention to emigrate or stay in China will depend on a person's social background.***

Turning to the push-pull framework, we expect different social groups to be attracted or repelled by different reasons for emigrating. Lower social groups could, for example, be repelled by the labor market in China because of a potential lack of the necessary social networks, while higher social groups could be attracted by possibilities of self-development. We therefore seek to divide the reasons into attracting and repelling forces and analyze a potential divide between these social groups.

The neoclassical framework on the other hand, argues that an individual estimation of the expected return from emigrating is the key underlying driver in the decision process. In line with this reasoning, we seek to investigate how the reasons that impact the expected return from emigrating, differs across social groups. If guanxi benefits higher social groups with more pronounced networks, while undermining the career possibilities of lower social groups, *ceteris paribus* it would be possible that the expected return should differ and therefore also the intention to emigrate.

### Relevance for future research

The relevance of our study is connected to two of the most cited drivers of the Chinese emigration - the lack of competitive academic institutions and discrimination on the job market.

During the 18th National Party Congress, Xi Jinping presented an anti-graft plan to reduce corruption in the country. A focal area of the campaign has been to prevent nepotism on the labor market in order to allow for employment based on skill rather than social ties. However, it was concluded by the Transparency International 2014 Corruption Perceptions Index, that the level of corruption has increased

since the National Party Congress (Armstrong, 2015). In April 2016, this anti-graft campaign was therefore further expanded, prohibiting officials to include relatives into state-owned enterprises (Jia, 2016). Further, the CCP has made immense investments in developing academic institutions in the country in order to enhance skills and innovation in the country and thereby form a new generation of competitive Chinese workers. However, if the CCP does not manage to prevent the nepotism, a large portion of China's skilled work force comes at no use.

Following this reasoning, we have seen a potential link between the drivers of emigration and socioeconomic background. Research on such a relationship is up until date scarce. This is a gap we wish to fill by investigating whether the intention to emigrate diverge with differences in individuals' social backgrounds,

The limited scope of this paper makes it impossible to draw any general conclusions about China from our results. However, if we find a relationship between social background and reasons behind the intention to emigrate, there could be valuable insights to gain from further studying this relationship to see if the same is true for a larger sample. In such case, it could provide a foundation for an efficient policy framework in order for the Chinese authorities to effectively target human capital retaining policies toward specific social groups.

## Method

In order to investigate our research question we apply econometrics. The dependent variable will represent the intention to emigrate. Since we can not assume the intention to be a uniform scale, the variable will be ordinal categorical. The data comes from an online survey collected at four Chinese top universities. Because of constraints on time and money for our data collection, we have limited ourselves to collect approximately 60 observations at each university. The survey was reached through a QR-code that was distributed during class by the authors, spring 2016. The design of the survey, and its methodology are described closely in section *survey design*. With above background and analytical framework, we will apply the following econometric tools.

### *Choice of econometric framework*

Assuming rational and individual decision making, the respondent will choose the level of intention that corresponds to the individual's perception of attractive and repelling forces<sup>14</sup>, and that maximizes the respondent's expected return, based on weighing expected costs and benefits<sup>15</sup>. Since we are dealing with intentions, we must allow for probability in our analysis. Our framework also has to take into account that

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<sup>14</sup> In line with the Push-Pull framework.

<sup>15</sup> In line with the Neoclassical framework.

we can not assume that the distance between the levels of intention in the dependent variable are uniform. Subsequently, we exclude the use of an OLS model<sup>16</sup>. Instead, we view the different levels of intentions as discrete categories rather than a scale. In the following text, we will call these categories the discrete values of our dependent variable.

As a result of the specific characteristics of our dependent variable, we turn to ordered response models and consider ordered logit and probit models. Using these models, we can preserve the inherent ordering of the discrete levels of intention to emigrate from China. They thus allow for incorporation of the additional insights that the ordering gives, when estimating the coefficients of the independent variables (Long, 1997)<sup>17</sup>. While the ordered logit model also preserves the order of the categories in the dependent variable, it is sensitive to low frequency counts. Assuming an uneven distribution of our limited sample size across the values of intention to emigrate, we are likely to see low numbers in some categories<sup>18</sup>. Combining categories would result in a loss of information. We therefore exclude this model. An ordered probit model, on the other hand, is designed to estimate relationships between an ordinal dependent variable and a set of independent variables. Due to its standard normal distribution, it is also not as sensitive as the logit model. Since the limitations of other generalized response models do not apply, we consider the ordered probit model to be the most accurate for our study question. The model is constructed as follows.

$y_i = \{1, 2, 3, \dots, j\}$  is the observed non uniform index representing the categories of our independent variable, where  $i$  indexes the observations, and  $j$  is the number of categories of the dependent variable. An underlying latent variable is assumed to follow a linear model of the form  $y_i^* = \beta^* x_i' + u_i$ . Where  $y^*$  is the unobserved intention to emigrate, ranging from  $-\infty$  to  $\infty$ . The relationship between the observed discrete  $y$  and the unobserved, continuous  $y^*$  is given as follows.

$$Prob(y_i = j) = Prob(\theta_{j-1} < \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_k x_{kj} + u_i \leq \theta_j)$$

$u_i$  is assumed to be normally distributed. We estimate  $\beta_1, \beta_2, \dots, \beta_k$  together with the cut points  $\theta_1, \theta_2, \dots, \theta_{j-1}$  where  $j$  is the maximum number of possible outcomes.  $\theta_1$  is taken as  $-\infty$  and  $\theta_j$  is taken as  $+\infty$ . The  $y_i$  results from grouping the underlying continuous variable  $y_i^*$  using the cutpoints so that  $y_i$  takes on value 1 if  $y_i^*$  is below cut point  $\theta_1$ , the value 2 if  $y_i^*$  is between  $\theta_1$  and  $\theta_2$  and value  $j$  if  $y_i^*$  is above  $\theta_{j-1}$ .

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<sup>16</sup> For example, the step from placing China as the country of first choice to placing it second choice, might be bigger than placing China as fourth compared to fifth choice.

<sup>17</sup> This reasoning is in comparison to the characteristics of multinomial logit and probit models where information on the order would have been excluded, resulting in decreased efficiency of estimators.

<sup>18</sup> Category one places China as the number one country to stay in, while number two can still represent a strong will to leave but conditional on the acceptance to a university in a specific country of choice.

The ordered probit model results from modeling the probit of the cumulative probabilities as a linear function of the covariates. The probability that an observation falls into one of the categories  $1, 2, 3, \dots, j$  is thus given as below:

$$Prob(y_i = j) = \Phi(\theta_j - \beta^* x_i') - \Phi(\theta_{j-1} - \beta^* x_i')$$

Where  $\Phi()$  is the standard normal cumulative distribution function. Differentiating this probability with respect to the explanatory variable gives the marginal effect of the probability of choosing category  $j$ . The maximum likelihood estimation technique is used for estimating the model. (Rodríguez, 2007; Güngör, 2006).

The ordered probit model is estimated by Maximum Likelihood (ML). The Maximum Likelihood technique calculates the betas maximizing the product of the log-likelihoods for all observations in the data. Under its assumptions, the ML estimator is consistent, efficient and asymptotically normal. This is true as the sample size approaches infinity, but accurate also for our expected sample size. When using this technique, heteroscedasticity in the variance of  $y$  is automatically accounted for (Wooldridge, 2013).

Furthermore, the ordered probit model makes the assumption that the independent variables of the model will have the same impact across each of the discrete values of the dependent variable. This assumption is known as the parallel regression assumption (Long and Freese, 2001).

### *Excluding the dimension of time*

In previous research, factors that vary across time are said to have a large effect on the decision to emigrate. Examples of these factors are current policies, tax rates, unemployment levels and the degree of economic stability (Zweig, 1997; Todaro, 1969). If unemployment is high, the expected return will be reduced, and the intention to emigrate increases. The effect from these variables would be best measured with an econometric model that includes the dimension of time. However, due to the limited scope of this paper we were unable to do so. Instead, we have chosen another approach where we ask open questions about the reasons behind the intentions to emigrate. We expect these factors to be mirrored in the reported reasons that the respondents provide. Also, since the focus of our study is social groups, we consider holding time fixed appropriate for our study questions. Therefore, we consider the loss of information that this exclusion can potentially cause, to be of minor impact for our results.

### Survey design

In order to investigate if the reasons behind intentions to emigrate differ across social groups, *ceteris paribus*, we identify a sample in the approximate same age, that study in similar environments with the

same opportunities. Since we are interested in the future intentions of China's to be top-intellectuals, a questionnaire is distributed at the top universities in China. Surveys are equally proportioned between Fudan University, Jiaotong University, Peking University, and Zhejiang University, that are all located in Eastern China. The choice of universities is motivated by the presumption that students at these universities graduate with the approximate same skill set. Not only is the education at these universities a product of similar curriculums, but students are also accepted to the universities on the same basis, with regards to skills and previous academic performance. In a well-functioning labor market, they should therefore be equally demanded by employers on the Chinese job market. The fact that universities are homogenous in location could cause bias to our data due to reduced variation in our sample population. However, we still consider the sample to be heterogeneous in terms of birth place, since students at the universities represent people from all across China. We therefore assume that respondents in our sample will differ in terms of social background. We recognize this to be a strong assumption. Due to the limited scope of this paper we weigh the potential loss of accuracy in our estimates against the length of our survey and hence the loss in number of students finishing the questionnaire. With constraints on time we consider the latter to have a larger effect on our data. Also, considering the above factors equal and constructing the survey as below, we believe that we can avoid resulting biasedness from this assumption.

In order to facilitate the collection of data, we use a digital survey in Mandarin. To prevent bias, queries are carefully considered. We translate the questionnaire into their local language for two main reasons. Firstly, we aim to increase the incentives for students to answer our open questions more thoroughly. Secondly, we want to decrease potential bias due to language barriers. The survey provides information on social background of the students, their intention to emigrate, and the reasons behind their intention. Demographic questions are followed by students ranking their desired countries for studies and work. This ranking is used to shape our dependent variable, which is further described in the section *proxy variables*. Direct questions regarding studies abroad and students' actual abilities to go abroad are left to the end of the questionnaire in order to minimize the risk of leading answers.

Since social background is a potentially sensitive topic that could cause bias to our dataset, we avoid queries that might be answered untruthfully, such as the level of parent's income. Instead we address this topic in more discreet modus. We check the social background through asking for the necessity of obtaining a scholarship to be able to study abroad, and their parents' academic level. This is further argued to present more accurate information since the income level of parents does not necessarily present the financial situation of the students due to many Chinese possessing resources that is not related to their income. For instance, bribery is common among police officers and the rapid increase in urban real estate prices has created a social group wealthy from this rather than high income levels (Hoang, 2016).

With above precautions there is no reason to suspect biasedness in our data from the collecting process. However, it is important to remember that we are checking students' intentions to emigrate and the

reasons behind these, and not actual migration patterns. Results should therefore be interpreted accordingly and separate from causes of actual migration.

## Proxy variables

### *Dependent proxy variables*

In order to avoid leading the students' answers we ask them to rank different countries, including China, according to their desire of where to study and work in the future. Placing China as their first choice means that they absolutely want to study/work in China and placing it as their sixth choice means that they absolutely want to study elsewhere. We then exclude all countries but China. Their ranking of China is used as a proxy variable for their intention to emigrate, which we recode into our dependent variable, the level of the intention to emigrate from China. Thus, placing China as their first choice corresponds to an extremely high intention to emigrate and placing it as their sixth choice corresponds to an extremely low intention to emigrate. The tables below show the index of the students' ranking and the recoded proxy-variable.

Table 2. *Students' ranking of desire to study in China*

| <b>Response Categories</b> | <b>Index</b> |
|----------------------------|--------------|
| China as first choice      | 1            |
| China as second choice     | 2            |
| China as third choice      | 3            |
| China as fourth choice     | 4            |
| China as fifth choice      | 5            |
| China as sixth choice      | 6            |

Table 3. *Dependent variable, emigration intention*

| <b>Response Categories</b>           | <b>Index</b> |
|--------------------------------------|--------------|
| Extremely low intention to emigrate  | 1            |
| Low intention to emigrate            | 2            |
| Could potentially stay in China      | 3            |
| Could potentially Emigrate           | 4            |
| High intention to emigrate           | 5            |
| Extremely high intention to emigrate | 6            |

In order to control for the validity of our dependent variable, we include control questions. Two queries regarding which country students wish to work in, and where they think it is the easiest to get a job, are added into our survey. Apart from controlling for the intention to study abroad, the use of the information provided by these is restricted to describing the characteristics of our sample population. Assuming that the probability of realizing the intention to emigrate decreases with time, we therefore only regress on the intention to study abroad.

### *Independent proxy variables*

By asking for the necessity of a scholarship in order to study abroad, we obtain a measurement which we recode into a proxy-variable for social background. Due to the low number of respondents with need of *no scholarship* or *half scholarship* we chose to merge these answers into representing students from higher social backgrounds. This is further motivated since the tuition fees of universities outside China are high compared to the Chinese income levels. Therefore, the ability to pay half scholarship also goes under the social group wealthy. We thus have a binary variable, *wealthy*, as our proxy for social background where 0 corresponds to not wealthy, and 1 corresponds to wealthy. In order to capture more of the variation in actual social background, we complement this variable by also outlining the academic background of parents.

### Regression model

In the regression, an ordered probit model is used due to the characteristics of our dependent variable with its discrete categories and non uniform levels of intention to emigrate. Our dependent variable measure the intensity of respondent's wish to emigrate from China, taking the values from 1 to 6<sup>19</sup>. Using the ordered probit model we can preserve the inherent ordering of the discrete levels of the intention to emigrate. Open questions regarding reasons behind the intention to emigrate has been recoded into dummy variables, and later checked against social background across the sample. The social background of respondents is controlled through the proxy variable *wealthy*, which has a binary character of 0 corresponding to not wealthy and 1 corresponding to wealthy. The dependent variable is regressed on the descriptive variables, *wealthy*, and different sets of reason variables in three regressions. The regressions are constructed in line with our push-pull and neoclassical framework, respectively. Firstly, we regress the intention to emigrate on the reason variables that we find corresponding to attraction forces of staying in China. Secondly we regress the intention to emigrate on the reason variables that we find corresponding to repelling forces from China. Lastly, we regress the intention to emigrate on the reason variables that are corresponding to the neoclassical thoughts and have a direct effect on the expected return for the respondent. In a second stage, factor analysis is conducted in order to reflect the variation of potential unobserved underlying variables.

### Data description

Our analytic framework will be applied to a dataset that we have collected from Chinese university students in line with above survey design. Below, we give an overview of the data by providing general

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<sup>19</sup> Where 1=extremely low intention to emigrate, and 6=extremely high intention to emigrate.

insights, as well as descriptive statistics on our dependent and independent variables.

Firstly, 84% of respondents have completed the survey, and 88% have answered the relevant questions to be included in our econometric framework. Secondly, compared to the full student population in China, our sample size is small. The reason behind this limited data sampling was constrained by time and money. While the Chinese university population, including undergraduate students, master and PhD students, was 23.91 million in 2012 (People's Republic of China Ministry of Education, 2013), our data includes only 243 observations. Our sample size is therefore 0.001% of the population. This means that we can not make any inferences from our results that would apply to the full student population in China. However, our dataset is large enough to fulfill statistical assumptions in our chosen econometric framework. In the ordered probit model we assume a standard normal distribution of standard errors, which can be assumed at our sample size. Our sample therefore serves our framework and can be further analyzed to study our research question. Out of the 243 respondents, 26 had not answered our open questions and we thus excluded these observations from our ordered probit model. All in all, we dropped 28 observations from our sample and the total number of observations left was 215.

### *Dependent variables*

Since some of the excluded respondents answered multiple choice questions but not the open questions, we kept them in the dataset when analyzing information that does not involve this missing information. Therefore, the number of observations for the variables describing the intention study and work abroad, is kept at 241 after excluding two respondents that have not answered or that have clearly misunderstood the survey. The same procedure is undertaken when analyzing exogenous variables.

Out of the 241 respondents that are left in our sample, we get some insights about the intention to study and work abroad. Firstly, we find a higher mean for the intention to study than to work abroad. On the question regarding where the students want to work, 46.4% of the respondents answered that China was their country of first choice. This is in contrast to their answer on their intention to study abroad, where only 7.88% chose China as their first choice. Based on information from these two variables, it seems likely that many students will follow the path that has been encouraged by the Chinese state. That is, they go abroad to gain knowledge, foreign perspectives and ideas, with the intention of then returning to their home country. Although this data shows a rather distinct difference between these two variables, the historic dimension is important to bear in mind when analyzing the results. It is likely that many of the students who leave the country for studies will stay there also to work, regardless their current intentions. Furthermore, the share of students that reported an extremely strong intention to work abroad was also of relevant size. 6.22% of the sample population said that they definitely wanted to work abroad. The corresponding share of students' intentions to study abroad is 19.5%.

Table 4. *Descriptive statistics on dependent variable*

| Variable                                               | Obs. | Mean | St. Dev | Min | Max |
|--------------------------------------------------------|------|------|---------|-----|-----|
| <b>Intention to Study Abroad</b><br><i>s_intention</i> | 241  | 4.06 | 1.65    | 1   | 6   |

Intentions to emigrate: 1-6 where 1=Extremely low intention to study abroad, 6=Extremely high Intention to study abroad

### *Outlining social background and gender*

The social background in our sample is represented by the variables *wealthy* and *parents\_academic*. *Wealthy* is a dummy variable where 1=wealthy and 0=not wealthy. *Parents\_academic* is the level of the respondent's parents' academic background, where 1=primary school, and 7=PhD degree (see **Appendix 2** for frequency tables for the data). There is a weak positive correlation (0.2475) between these two variables. This is reasonable since a parent with a higher educational level is, on average, more likely to be better off. However, since this correlation is not strong, both are relevant representatives for social groups since they contain different information that could complement the other. The distributions of our sample on these variables is shown in the tables below.

In our dataset, 44.00% are women. This is relatively close to the national gender distribution at universities at bachelor, master and PhD in China, that was 49.86% as of 2008 (Ma, 2010).

Table 5. *Descriptive statistics on exogenous variables*

| Variable                                                    | Obs. | Mean | St. Dev | Min | Max |
|-------------------------------------------------------------|------|------|---------|-----|-----|
| <b>Social background</b><br><i>wealthy</i>                  | 240  | 0.15 | 0.36    | 0   | 1   |
| <b>Academic level of parents</b><br><i>parents_academic</i> | 240  | 4.51 | 1.28    | 1   | 7   |
| <b>Gender</b><br><i>female</i>                              | 243  | 0.44 | 0.50    | 0   | 1   |

Wealthy: Binary where 1=Wealthy, 2=Not Wealthy; Parents\_Academic: 1-7 where 1=Primary School, 2=Upper School, 3=High School, 3=Bachelor Degree, 4=Master Degree, 5=Doctor Degree; Female: Binary where 1=Female, 2=Male

Data on the proxies for social groups indicates that the mean intention to study and work abroad is higher for students with a background where parents are unable to afford their university tuition. An interesting dimension when looking at this data is how the intention to study abroad is distributed across the level of the parents' academic background. The highest intention answers to those whose parents have studied at intermediate to upper school, with declining intention for those whose parents have either lower or higher educations. A similar pattern goes for the intention to work abroad across the academic background of parents (see **Appendix 3**).

### *Outlining reasons driving the intention to emigrate*

Answers to the open questions in our survey, representing the reasons behind the intention to emigrate, are interpreted and coded into dummy variables, that are clarified in **Appendix 4**. We found eight recurring reasons behind the intention to study abroad, and three additional reasons behind the intention to work abroad. Since the third open question regarding the intention to emigrate did not provide additional information, we have chosen to exclude it in the following discussions. One of the most frequently mentioned reasons behind the intention to study abroad is a strongly negative attitude toward universities in China. This is in line with our previous discussion on the country's lack of qualitative academic institutions. Another reason is the will to study in a more developed country, where welfare and advanced science and technology or infrastructure are common expressions. Despite the recent growth in China's economy, it is clear that the country has a long way to go before its own population perceive it as developed. Furthermore, an interesting reason is the curiosity about the world, expressed through a wish to learn new languages, experience other countries or learn new sports. The intention to work abroad is also driven by the will to experience more developed countries, where students mention factors such as the benefits of welfare or advanced science companies. The most recurring answer driving the intention of where to work is, however, a will that holds the students to their home country. Namely, the sense of cultural belongingness.

It is relevant to our research question to study these reasons across the social background of the sample population. In below table, the mean of each reason can be seen across different levels of necessary scholarship. In this stage of the study, we choose to include the variable scholarship instead of wealthy since it provides more information. Opportunities and education system are more important to students coming from households who are able to afford full scholarship for their children. International exploration, work environment, low living costs, and easy adaption are most important for those with parents who can afford half a tuition fee. Political environment, nature and developed country are more important for the students with no possibility of paying for university. These numbers show patterns that indicate differences between the reasons that drive the intention for social groups. However, they have yet not been tested for their significance, why we restrain our speculations about their implication for our research question.

Table 13. *Reasons that drive the intention to study abroad, across scholarship*

| <b>Necessary scholarship for studying abroad</b> | <b>Full (=household does not afford tuition fee)</b> | <b>Half (=household affords half tuition fee)</b> | <b>No (=household affords full tuition fee)</b> |
|--------------------------------------------------|------------------------------------------------------|---------------------------------------------------|-------------------------------------------------|
| <b>Variable</b>                                  | <b>mean</b>                                          | <b>mean</b>                                       | <b>mean</b>                                     |
| <b>Opportunities</b>                             | 0.08                                                 | 0.13                                              | 0.16                                            |
| <b>International exploration</b>                 | 0.30                                                 | 0.34                                              | 0.25                                            |
| <b>Developed country</b>                         | 0.27                                                 | 0.21                                              | 0.27                                            |
| <b>Nature</b>                                    | 0.12                                                 | 0.02                                              | 0.00                                            |
| <b>Cheap</b>                                     | 0.03                                                 | 0.06                                              | 0.03                                            |
| <b>Easy adaption</b>                             | 0.06                                                 | 0.19                                              | 0.09                                            |
| <b>Political environment</b>                     | 0.10                                                 | 0.06                                              | 0.06                                            |
| <b>Education system</b>                          | 0.34                                                 | 0.40                                              | 0.53                                            |
| <b>Number of observations</b>                    | <b>142</b>                                           | <b>47</b>                                         | <b>32</b>                                       |

### *Data issues*

In general, there are a number of issues with our data that we would like to bring to the surface. Firstly, the proxy variables are designed to capture the social background of the students. However, it is difficult to define a variable that captures the variation of real social background, since it is a function of many other factors apart from parents' academic level and necessity of scholarship. The relationship between academic background of parents and wealthy is only weakly correlated. It is therefore likely that there are other variables that could provide improved explanatory value to our model. This would suggest that our model suffers from an omitted variable bias, which could severely affect our results. Moreover, there could be measurement errors in our data due to respondents' misinterpreting our survey, or biased judgments if they experienced uncertainty when answering the survey. Two observation were excluded from the sample because of clear misinterpretation. However, we have no reason to believe that there are systematic measurement errors in the data. Instead, we argue that we have been able to avoid bias in the collecting process as well as in formulating the questions in our survey. Regarding our manual interpretation when coding the open questions<sup>20</sup>, there are some doubts we wish to highlight. Though ambiguous observations were excluded from the regressions, we can not ignore the possibility of having misinterpreted answers. This would render measurement errors which would increase standard errors and thus higher significant levels.

<sup>20</sup> Open question on the reasons behind the intention to emigrate.

Still, we recognize the size of our sample to be the biggest issue. There are two main reasons for this. Firstly, this implies that we have a very low frequency in our dummy variables. Despite our hope of getting qualitative, in depth answers by asking open question, most of the respondents reported one or two reasons for their intention to emigrate. After coding these reasons into dummies, the frequency on some of these variables became low (min 8, max 91). This means that it can be difficult to find significant relationships. Secondly, the small sample size limits our ability to run regressions with many variables, since it reduces the degrees of freedom in our model. This causes high standard errors, and could injure potential relationships that could have been found, had the sample size been larger.

Due to the constraint on the possible number of variables that can be included in our model, we recognize that the regression we will construct is likely to suffer from omitted variable bias. One potential source of bias comes from omitting year of birth. However, with all students being enrolled at the universities, we assume them to be within the same age group. We have also chosen to omit what university a respondent is enrolled at. The reason for this is that we have assumed that the universities are similar in international activities such as exchange programs and including international research in their curriculums. Previous international experience is controlled for in the survey through the question regarding previous studies abroad. However, students may have gained other sources of international experience from travelling or working, why this may cause our regression omitted variable bias anyway. Also the variable birthplace is likely to be excluded in our model, due to our restricted sample size. Even if this variable is controlled for in the survey, its addition of information would be limited due to the reduction in degrees of freedom it would cause. We are thus deprived of the additional insights these variables would have given us, which we have to account for in our conclusions.

The motivation for our exclusion of these variables is derived from the trade-off between sample size and number of questions in our survey. Weighing these two against each other, we consider the sample size more important.

## Application of the model

To further investigate our research question, we use our ordered probit model to test the effect of our dummy variables for reasons on the intention to emigrate. We will apply the model on the intention to study abroad and its drivers. We construct three ordered probit regressions, with the dependent variable *s\_intention*, representing the intention to study abroad. Its values range from 1 to 6 where 1 is an extremely low intention to emigrate and 6 is an extremely high intention to emigrate.

### *Factors affecting the intention to emigrate*

To test how the reasons behind the intention to emigrate differs across social groups, we must control for other factors that might have an effect on the intention to emigrate.

Previous research has shown that gender has an affect on the intention to emigrate, where women are more likely to have a stronger intention than men (Zweig and Chang, 1995). We therefore control for gender, with the dummy variable *female*.

The motivation for our exclusion of other variables that could have affected the intention to emigrate, is derived from the trade-off between sample size and number of questions in our survey. Weighing these two against each other, we consider the sample size more important.

### *Proxies for socioeconomic background*

The variables for social background: *wealthy* and *parents\_academic*, measure the socioeconomic background of the respondents. *Wealthy* is a dummy variable where 1=wealthy, and 0=not wealthy. *Parents\_academic* represents the academic level of the parents and is measured on a scale from 1 to 7. To examine the effect of these on the intention to emigrate, these variables will be included as independent variables in a first stage. To compare the reasons given by respondents over socioeconomic background we split the dataset across the variable *wealthy*, in a second stage. Thereafter, we wish to test the coefficients from each regression against one another.

### *Dummy variables representing reasons*

These variables provide insights into the differing reasons underlying the intentions to emigrate within our sample. We will divide the reasons into push and pull factors and run two regressions separately. In contrast to how Lee used the Push-Pull model, pull factors in our model will correspond to the reasons that retain the students in their home country. Since we seek to investigate if there are reasons to believe that the CCP's could target their human capital retention policies more efficiently across social groups, we will focus on how the reasons are connected to China and exclude pull factors for other countries. This is outlined in **Appendix 5**. Thereafter we will run a third regression based on the neoclassical theories.

Drivers cited in the neoclassical theories are for example demand for labor, higher wage, and increased productivity. According to Sjaastad (1962) migration is an investment that increases the investment of human capital, such as knowledge and skills. Since people come from different backgrounds, they can expect different returns from migrating. We have chosen to include factors that, in line with this reasoning, have a direct effect on the expected return from emigrating. Our variable opportunity reflects the search for better career opportunities. Develop expresses a will to work in a country with better technology, infrastructure and welfare, which can result in increased productivity. The variable education

system explains a long-term investment in knowledge and skills. The respondents who reported the variable cheap view the cost of living or a lower tuition fee as important drivers of migration. The variable therefore represents both an increase or a decrease in expected return of emigrating.

### *Our regressions*

First regression, Push-pull: Retaining factors

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \beta_1 parents\_academic + \delta_2 wealthy + \delta_3 easyad\_s + \delta_4 cheap\_s$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 easyad\_s + \delta_3 cheap\_s \text{ if } \mathbf{wealthy} = 1$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 easyad\_s + \delta_3 cheap\_s \text{ if } \mathbf{wealthy} = 0$$

Second regression, Push-pull: Repelling factors

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \beta_1 parents\_academic + \delta_2 wealthy + \delta_3 oppo\_s + \delta_4 intexpl\_s + \delta_5 develop\_s + \delta_6 nature\_s + \delta_7 polenv\_s + \delta_8 edusys\_s$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 oppo\_s + \delta_3 intexpl\_s + \delta_4 develop\_s + \delta_5 nature\_s + \delta_6 polenv\_s + \delta_7 edusys\_s \text{ if } \mathbf{wealthy} = 0$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 oppo\_s + \delta_3 intexpl\_s + \delta_4 develop\_s + \delta_5 nature\_s + \delta_6 polenv\_s + \delta_7 edusys\_s \text{ if } \mathbf{wealthy} = 1$$

Third regression, Neoclassical: Expected return

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \beta_1 parents\_academic + \delta_2 wealthy + \delta_3 oppo\_s + \delta_4 develop\_s + \delta_5 cheap\_s + \delta_6 edusys\_s$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 oppo\_s + \delta_3 develop\_s + \delta_4 cheap\_s + \delta_5 edusys\_s \text{ if } \mathbf{wealthy} = 1$$

$$Prob(s\_intention = j) = \beta_0 + \delta_1 female + \delta_2 oppo\_s + \delta_3 develop\_s + \delta_4 cheap\_s + \delta_5 edusys\_s \text{ if } \mathbf{wealthy} = 0$$

### *Additional controls*

The ordered probit model makes the assumption that the independent variables of the model will have the same impact across each of the discrete values of the dependent variable. This assumption is known as the parallel regression assumption (Long and Freese, 2001). Examining our data, we consider there to be no reasons to believe that the vectors would vary across the intention to study abroad. However, in order to rule out the probability of violating this, we will test the equality of coefficients across response categories, using Stata.

To exclude the risk of multicollinearity in our regression, we will examine the correlation between our explanatory variables (see **Appendix 6**). We consider the examination to be especially

important between our proxy variables on social groups; the academic level of parents, and the level of wealth since both indicate socioeconomic status. The correlation between the reason variables is also of great importance since there could be underlying and correlating patterns present in the data.

The explanatory value of an ordered response model, such as the ordered probit model, can be estimated by McFadden's pseudo R-square. The pseudo R-square has the following equation:

$$\text{McFadden's pseudo R-square} = 1 - \frac{L_{ur}}{L_0}$$

Where  $L_{ur}$  is the log-likelihood function for the estimated model and,  $L_0$  the log-likelihood function for the model with only an intercept. In the case that our independent variables have no explanatory power,  $1 - \frac{L_{ur}}{L_0}$ , resulting in a pseudo R-square of zero. While the McFadden value cannot be interpreted directly in the way of a regular R-square, a higher pseudo R-square signifies higher explanatory power of the model (Wooldridge 2013).

The ordered probit model is estimated by Maximum Likelihood (ML). The Maximum Likelihood technique calculates the betas maximizing the product of the log-likelihoods for all observations in the data. Under its assumptions, the ML estimator is consistent, efficient and asymptotically normal. This is true as the sample size approaches infinity, but accurate also for our expected sample size. When using this technique, heteroscedasticity in the variance of  $y$  is automatically accounted for (Wooldridge, 2013).

Due to the underlying assumptions of our ordered probit regression model, the coefficients for our independent variables cannot be interpreted as their direct effect on probability given a one unit change. Instead, coefficients signify the effect on the z-score of the probability. As this effect differs depending on the starting point, it has no constant effect on actual probability. In order to estimate the constant effect our independent variables have on the probability of approval, we will calculate marginal effects. The marginal effect of an independent dummy variable is the change in probability given a change from 0 to 1, holding all other variables fixed at their means (O'Halloran 2010).

### *Including factor analysis into our econometric framework*

We consider extending the econometric framework to include for factor analysis. The idea behind factor analysis is that common factors can be detected that drive the common variation of some variables. Factor analysis is a statistical method used to find a small number of uncorrelated variables (factors) starting from a bigger number of correlated observed variables. These variables indicators are modeled as linear combinations of the potential factors and their error terms. Mathematically, the total variance of any

indicator (for example lack of academic institutions in China) can be decomposed into two components. The first part is in common with the general factor, and is referred to as communality if the indicator with the common factor; the second part is equal to the variance of the indicator minus its communality.

The motivation for the use of factor analysis in this paper is that we see patterns in the data that indicates latent relationships in the variation of the reason variables. Since we have been unable to outline these patterns when coding the dummy variables or scanning the data, we wish to further investigate these relationships in order to see if they can provide additional information to our study question. There are two main reasons for using factor analysis in our study. Firstly, it can be used to reduce the number of variables. This facilitates our study since inclusion of too many variables makes the model inefficient due to reduction in the degrees of freedom. Defining a factor makes it possible to account for the variables that drive most variation without losing efficiency. Secondly, by using factor analysis we can potentially detect a structure in the relationships between variables.

### *Omitted variables*

To test how the reasons behind the intention to emigrate differs across social groups, our regression must control for other factors that might explain the variance in the intention to emigrate. The variables that we exclude from our model might therefore cause omitted variable bias to our regression, which is something we have to take into consideration when analyzing the results.

## Results and Inference

In this section we present results from our analysis. To examine a possible difference in reasons behind the intention to emigrate across social groups, we apply an ordered probit model. We will regress our dependent variable on three different combinations of variables. The results will be presented as follows. Firstly, we will regress the dependent variable on attracting reasons in line with the Push-Pull framework. We will begin by introducing brief insights about the full sample, and then proceed by introducing insights gained from dividing the sample across the variable *wealthy*. Secondly, we will regress the dependent variable on repelling reasons, also in line with the Push-Pull framework. We will present the regression using the same procedure as for the attracting reasons. Lastly, we present a regression where the dependent variable is regressed on reasons connected to the Neoclassical approach, again using the same procedure.

We begin with excluding 28 respondents due to missing data on the open questions, and are thus left with 215 observations that can be included in the regression.

### First regression, Push-Pull: Retaining factors

Regressing the intention to study abroad on the retaining factors, we see that *parents\_academic* shows a negative effect on the dependent variable. It thus shows that the level of parents' education will impact the intention to emigrate. Students who have parents with higher academic degrees, will also be likely to have lower intentions to study abroad. Also the variable *female* shows positive estimates on significant levels, indicating that women are more likely to emigrate than men. The Wald Chi-Square for the regression with the full sample population is significantly separated from zero. (see **Appendix 7**).

Regressing the intention to study abroad on the two social groups, respectively, allows us to investigate if the coefficients of the reasons diverge across socioeconomic background. *Easy adaption* shows a negative effect on the intention to study abroad on a significant level for the not wealthy group. This effect seems natural, since students who seek to live in their home country will have a lower intention to emigrate. The variable includes the feeling of belongingness to the home country, but also the convenience of not having to adapt to other cultures and languages. The reason behind the significant results for the not wealthy group could be that this group is likely to have travelled less than their wealthier fellow students. They would thus not be as accustomed to foreign cultures, why emigrating could be perceived as more challenging. Since the estimates for the wealthy group does not show the significant levels, these results do can not be seen support our hypotheses of different socioeconomic groups having different reasons behind their intention to emigrate. However, this analysis provides some insights into the reasons that drive the not wealthy group of Chinese top-students.

Furthermore, the variable *cheap\_s* shows interesting results. According to our categorization of this variable as a retaining factor, this variable was assumed to have a negative effect on the intention to emigrate for the full sample population. While the sign is indeed negative, it does not show significance. When looking at a cross tabulation of *cheap\_s* across *s\_intention* we see that its observations are spread rather evenly over the dependent categories. This indicates that the perception of China as a developing country with low living costs, is not necessarily true, since individuals who seek lower costs may also emigrate due to this specific reason. An explanation for this could be that all of our respondents live in large cities in eastern China, where price levels are in fact similar to those in developed countries.

## Second regression, Push-Pull: Repelling reasons

Regressing the intention to study abroad on the push factors, we see that *wealthy* shows a negative effect on the dependent variable. It thus shows that the belongingness to a certain social group has an effect on the intention to emigrate, which indicates that there are underlying reasons that make less wealthy people more prone to emigrate. The Wald Chi-Square for the regression with the full sample population is significantly separated from zero (see **Appendix 8**).

Regressing the intention to study abroad on the two social groups, respectively, allows us to investigate if the coefficients of the reasons diverge across socioeconomic background. *International exploration and education system* show positive effect on the intention to study abroad at significant levels for the wealthy group. If students from higher social groups have other priorities than those from lower social groups, this would indicate that this group values self-development and exploration. Also, those within the wealthy group who value education systems will be significantly more likely of having a higher intention to emigrate. It is difficult to outline the reason behind this result. However, a potential explanation is that the parents of these students may have studied abroad since they are likely to have been in that age range at the time when the CCP strongly promoted overseas education for the Chinese young high-achievers. As previous research has shown, the *political environment* seems to have a positive effect on the intention to emigrate from China. This is likely to indicate a continued discontent for the political leadership in China. In our data, this result is significant when including the full sample population in the regression. However, when dividing the sample across social groups we can not outline any significant difference for this variable.

Remaining reasons do not show significant results for the wealthy group, and no reason coefficients show significance for the not wealthy group. We are therefore unable to confirm or reject our hypothesis of different socioeconomic groups having different reasons behind their intention to emigrate.

### Third regression, Neoclassical: Expected return

Regressing the intention to study abroad on factors related to measuring expected return, we see that *wealthy* shows a negative effect on the dependent variable. It thus shows that the belongingness to a certain social group has an effect on the intention to emigrate, where lower social groups are more likely to emigrate. The reason for this should be mirrored in differences in the expected return for each group, which would suggest that students from a lower social group, with lack of guanxi, expect a higher return. The variable *female* also shows positive estimates on significant levels, indicating that women are more likely to emigrate than men. The Wald Chi-Square for the regression with the full sample population is weakly significantly separated from zero (see **Appendix 9**).

Regressing the intention to study abroad on the two social groups, respectively, allows us to investigate if the coefficients of the reasons diverge across socioeconomic background. Also in this regression, *education system* shows a positive estimate for the wealthy group on a significant level.

It is interesting to see that the reasons that drive the intention does not differ more between the groups at significant levels. For example, if guanxi would have been an underlying reason for students from not wealthy groups to go abroad, the variable *opportunities* would have shown more pronounced estimates. The reasoning behind this is that guanxi would decrease the expected return in the home country for the not wealthy and incentivize a strive for opportunities elsewhere. However, in the regression, this variable is in fact negatively correlated with the intention to emigrate, meaning that those who seek career opportunities are more likely to stay in China. However, since these marginal effects are not significant we can not be sure of their accuracy. In contrast to estimates of *opportunities* for the not wealthy group, the variable shows a positive sign for the wealthy. While we want to stress that these results are not significant, these estimates indicate that the differences in the intention to emigrate does not correspond to expected outcome in line with a neoclassical approach. We see two alternative explanations for this. The first alternative is that, assuming guanxi affects social groups differently, the neoclassical framework is not compatible with the results of this study. Second, if the neoclassical framework is applicable to our sample, guanxi does not affect social groups differently on the labor market.

All in all, we can not outline any differences behind the intentions to emigrate across social groups.

### Extending the analysis: Introducing factor analysis

Since we found significant results on the effect of the variable *wealthy* on the intention to study abroad, we believe there is potential for additional information to extract about underlying reasons across social groups. Factor analysis has been used to reduce the big amount of dummy variables from our coded reasons, and to obtain emigration drivers which are unobservable and hard to identify. For example, there

may be a relationship between the intention to emigrate because of reasons included in *opportunities*, and the intention to emigrate because of reasons included in *education system*, if students prioritize an improved career before living in their home country.

The correlation among the reasons is used to create a factor which aim is to measure latent patterns in the variation of the reasons. We chose to limit our analysis to two factors because of the relatively small number of variables included in the factor analysis, and the limited sample size. Factor 1 shows positive correlations with *international exploration* and *nature*, while it shows negative correlations with *education system* and *opportunities*. It is thus a pattern that indicates a search for culture and history as well as nature and tranquility rather than improving chances for a successful career. This factor captures 71,29% of the variance in the observed variables.

Factor 2 on the other hand, shows positive correlations with *development* and *opportunities* compared to its negative correlations with *cheap* and *easy adaption*. It thus indicates a will to trade cultural belongingness in the home country for an advanced economy with high technology, infrastructure and welfare. It captures 46,05% of the variance in the observed variables.

Next, while keeping *wealthy* and *female* in the regression, we substitute the explanatory dummy variables for reasons with our two new factors to see how these latent variables have an effect on the intention to study abroad. None of the two factors show significant results (see **Appendix 10**). In order to draw general conclusions about their relationship with our dependent variable, we drop the factor with the weakest significance level, *Factor 1*. By doing this, we hope to see if the results from *Factor 2* could potentially improve our model. No significant results were received. Subsequently, we can not draw any valuable conclusions. Also when splitting the dataset across the variable *wealthy*, and regressing the intention to study abroad on *Factor 2*, we found no results that were significant.

## Testing for the parallel regression assumption

Finally, we test for the parallel regression assumption with an approximate LR test, using Stata. The assumption is not rejected at 0.01 level for any of the regressions. However, the assumption for the second regression was rejected at 0.05 level. This assumption is frequently violated (Long and Freese, 2001), and when so it is suggested to consider alternative approaches. For example, we could explore interactions and quadratic terms. However, due to our limited data set and the characteristics of variables, these alternatives would likely not improve the model. Interactions complicate ordered probit models, and quadratic terms have no effect on dummy variables. Even if this imply potentially uncertain estimates, we thus consider alternative models outside the scope of this thesis and disregard the violation of this assumption.

## Discussion and Limitations

We have had two main objectives with this paper. Firstly, there is an urgent need for China to improve their policies regarding human capital retention. While insufficient implementation of these policies have been argued to be the main constraint for success, we saw a potential lack of efficient targeting. Based on our framework where individuals maximize their expected returns, people with different social backgrounds have varying push and pull factors that incentivize their decision to emigrate. Since policies are designed to meet these incentives, efficient targeting of social groups would improve implementation. Secondly, since we have not been able to find any literature on the link between socioeconomic background and reasons behind the intention to emigrate, our aim with this paper has been to shed light on this gap and outline a foundation for future studies.

### Insights gained

We found that the coefficient for *wealthy* on the intention to study abroad was separated from zero on significant levels. This indicates that there should in fact be differences in perceived expected returns for people with varying socioeconomic backgrounds. Since our results showed a stronger intention to emigrate for lower social groups, this could be connected to factors such as lack of *guanxi*. Assuming equal skill-sets in our sample, a lack of social networks would increase the expected return from emigrating. Through our regressions, we have however, not been able to identify any differing reasons on significant levels that would support this theory. Some estimates even show results that contrast this neoclassical school of emigration. Due to the uncertain accuracy of these results, we can neither reject nor accept these intriguing estimates. The result, in itself, is interesting since the Neoclassical school has been the benchmark of emigration literature since the middle of the 1900s.

While this study has not shown differences in reasons behind the intention to emigrate, we have gained some insights for each social group. For the wealthier group, *international exploration* and *education system* were shown to be push-factors at significant levels. For the not wealthy group, easy adaption showed significant as a retaining (pull) factor. We can not outline if the effect of these reasons on the intention to emigrate are equal across both groups due to the insignificance of the estimates. Even if we rejected that *wealthy* differed from zero on significant levels, our estimates of the reason variables implies that we have been unable to provide a foundation that would point at reasons that differ across social groups, and hence indicate how future research could be shaped in order to see how the CCP could target their policies. Looking at our regressions, we can therefore not confirm that *guanxi* fosters an increased emigration for the share of China's human capital that comes from less wealthy homes.

However, differences between social groups were showed when looking at the means of attracting and retaining factors. We therefore ask ourselves why the insignificance in our results. We consider our small

sample size, and a questionable construction of our proxy variable for social groups, the main obstacles in our data. We therefore argue that studying this on a bigger scale could potentially provide more accurate insights in differences in expected return across social groups.

Turning to our factor analysis, we found some interesting patterns underlying the observed reasons when performing a factor analysis. The factors showed that respondents were divided into two groups where one group indicates a search for culture and history as well as nature and tranquility rather than improving chances for a successful career. The other factor indicates a will to trade cultural belongingness in the home country for an advanced economy with high technology, infrastructure and welfare. This supports our theory that there are different groups with differing reasons behind their intention to emigrate. Again, due to our many limitations, we were unable to investigate whether these groups are tied to socioeconomic concerns. We therefore leave these insights to future research.

## Limitations

Due to the extensive area of research in connection with constraints on time, we have had to limit the scope of the survey and sample size. Potential implications on our results must be taken into account for, when considering their wider applicability. Other than our sample size, we recognize that our proxy variable for social groups, wealthy, fails to capture all the variance in socioeconomic background. It is therefore likely that there are other variables that could provide improved explanatory value to our model. This would have large implications to the results discussed above since the division of respondents into separate groups would be invalid. We also recognize a potential omitted variable bias in our regressions, due to variables that were excluded from our model. With this in mind, we regard our results with precaution.

As mentioned earlier in this paper, its scope is limited to the intention to emigrate rather than realized emigration and that our sample population, to our knowledge, has yet not expressed real intentions to emigrate. This implies that we are constructing a hypothetical scenario for our respondents, which is likely to affect our results due to a divergence between top-of-mind reasons in a hypothetical, compared to a well-reasoned and actual emigration scenario.

Also, we have limited our research to the micro perspective of migration, where the decision is individualistic. The motive for this was that the students in our sample live at the university campus and we can therefore assume that their major sources of influence derives from their surrounding environment, rather than their families. We thus excluded the probability that parents affect the reasoning behind potential emigration. However, since the Chinese society is patriarchal, with parents in the family traditionally having a lot to say about the future of their children (Dutton, 1992), it is likely that our assumption simplifies the actual decision process. While we received many answers claiming international

exploration as the main individualistic driver for studying and working abroad, the actual driver for real emigration can still be monetary reasons prompt by the household.

Finally, we acknowledge that the actual efficiency gains from targeting specific groups when establishing retention policies is to our knowledge unknown and beyond the scope of this paper.

## Conclusion and Implication

This paper contributes to the scarce research regarding the relationship between socioeconomic background and reasons behind the intention to emigrate. Our aim has been to provide a foundation for future research regarding this relationship and thus investigate if the CCP can target their human capital retention policies more efficiently. We have collected data on the intention to study and work abroad from four top-universities in eastern China. Our data contains 215 observations after necessary exclusions. We applied an ordered probit model to test how the intention to emigrate and its underlying reasons correlate with social background. We find that social background has explanatory value for the intention, where individuals from lower socioeconomic groups are more likely to emigrate. We have reasons to believe that it is due to our restricted data sample and a potential inadequacy in capturing all variance in social background, that we were not able to identify the underlying reasons that drive the different social groups. We see that some reasons affect the different groups, but we can not reject the probability that the same reasons also affect the other. Hence, we can not reject the possibility that the reasons are equally important across socioeconomic backgrounds. Turning to our neoclassical framework, we see two alternative explanations for this. Firstly, assuming guanxi affects social groups differently, the neoclassical framework is not compatible with the results of this study. Secondly, if the neoclassical framework is applicable to our sample, guanxi does not affect social groups differently.

Conclusively, we want to stress that these results are not representable for China's entire student population, due to the size of our study. However, there are reasons to believe that our results may apply to students at China's limited number of top-universities, which educate the most highly skilled share of China's future human capital. Our hope was to confirm a relationship between different reasons and the intention to emigrate across socioeconomic background. This would have suggested that the CCP should identify these differences in order to target their retention policies more efficiently. While we did not manage to fully confirm this relationship, we found enough indications to argue for future research to investigate this more thoroughly on a bigger scale. The high level of skilled emigration from China, with resulting loss in human capital, shows the necessity of such research.

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## Appendix 1: Policies and Interventions established by the CCP (pp.7)

*Due to the large numbers of skilled emigrants, the Chinese government and its institutions actively engage in retaining their human capital. Below we present a brief presentation of the most impactful and important of the programs and policies that have been introduced by the Ministry of Education and the Chinese Academy of Sciences.*

- **Financial policies**

Many state programs give overseas students financial support conditioning their return. Funding has also been spent on improving the quality of Chinese universities for researchers and faculty staff in order to counteract the earlier incentive to stay abroad due to better research conditions.

- **Improving the flow of information**

The Chinese government has initiated programs that aim to improve the communication of its improved working conditions and economic growth to its overseas population. The reason for these programs is that many of the Chinese who are living abroad view China as it was a decade ago, and chose to stay abroad due to its past standards. The programs thus work to bridge the information gap between agencies and overseas researchers.

- **Easing the process of returning**

The government has adopted policies that aims to facilitate the return and resettlement of returnees. Services that help individuals find jobs and housing are examples of initiatives. The state also encourages its provinces to establish schools for children of returnees, whose weak Chinese is disadvantageous relative their Chinese-speaking classmates.

- **Short-term visits to “serve the country”**

The state encourages people to return for short periods to engage in collaborative projects or give lectures. The aim is to show their overseas population how China has changed and as subsequently convince them to return.

- **Overseas centers**

The CCP and its ministry of Education have established overseas centers that organize student events for the Chinese overseas students, and operate service centers and recruitment delegations to provide information about the Chinese job market. The objective of these activities is to enable an information channel that reaches students countries with high density of Chinese students to encourage their return to China. Promising jobs, high salaries and housing benefits, they aim to plant the intention of returning to China in the minds of their overseas population. However, these efforts have proved inefficient due to a divergence between promised and realized benefits to the returnees. This has instead fostered a cynicism towards the delegations and centers (Zweig, 2006).

## Appendix 2: Frequency of Proxy Variables over Social Groups (pp.23)

Table 6. *Frequency table of wealthy*

|                    | 1               | 2             | 3             |
|--------------------|-----------------|---------------|---------------|
| <b>Scholarship</b> | 152<br>(62.55%) | 51<br>(21.25) | 37<br>(15.42) |

Social group: 0= not wealthy, 1=wealthy

Table 7. *Frequency table of wealthy*

|                     | 0               | 1              |
|---------------------|-----------------|----------------|
| <b>Social group</b> | 152<br>(62.55%) | 91<br>(37.45%) |

Social group: 0= not wealthy, 1=wealthy

Table 8. *Frequency table of academic background of parents*

| <b>Level of parents' academic background</b> |                |
|----------------------------------------------|----------------|
| Primary school                               | 3<br>(1.29%)   |
| Intermediate school                          | 9<br>(3.86%)   |
| Upper school                                 | 36<br>(15.45%) |
| High school                                  | 64<br>(27.47%) |
| Bachelor degree                              | 92<br>(39.48%) |
| Master degree                                | 22<br>(9.44%)  |
| Doctor degree                                | 7<br>(3.00%)   |

### Appendix 3: Distribution of Social Groups across the Intention to Study and Work (pp.24)

Table 9. *Mean intention to study abroad across necessary scholarship*

| Level of necessary scholarship | Obs. | Mean intention to study abroad |
|--------------------------------|------|--------------------------------|
| Full                           | 152  | 4.25                           |
| Half                           | 51   | 3.94                           |
| None                           | 37   | 3.46                           |

Intention to study abroad: 1-6 where 1 = Extremely low intention to study abroad,  
6 = Extremely high intention to study abroad

Table 10. *Mean intention to work abroad across necessary scholarship*

| Level of necessary scholarship | Obs. | Mean intention to work abroad |
|--------------------------------|------|-------------------------------|
| Full                           | 152  | 2.40                          |
| Half                           | 51   | 2.57                          |
| None                           | 37   | 2.22                          |

Intention to work abroad: 1-6 where 1 = Extremely low intention to work abroad,  
6 = Extremely high intention to work abroad

Table 11. *Mean intention to study abroad across academic background of parents*

| Level of parents' academic background | Obs. | Mean intention to study abroad |
|---------------------------------------|------|--------------------------------|
| Primary school                        | 3    | 1.00                           |
| Intermediate school                   | 9    | 5.00                           |
| Upper school                          | 36   | 4.56                           |
| High school                           | 64   | 4.09                           |
| Bachelor degree                       | 91   | 3.87                           |
| Master degree                         | 22   | 3.95                           |
| Doctor degree                         | 7    | 4.00                           |

Intention to study abroad: 1-6 where 1=Extremely low intention to study abroad,  
6=Extremely high intention to study abroad

Table 12. *Mean intention to work abroad across academic background of parents*

| Level of parents' academic background | Obs. | Mean intention to work abroad |
|---------------------------------------|------|-------------------------------|
| Primary school                        | 3    | 1.00                          |
| Intermediate school                   | 9    | 2.33                          |
| Upper school                          | 36   | 2.64                          |
| High school                           | 63   | 2.33                          |
| Bachelor degree                       | 92   | 2.37                          |
| Master degree                         | 22   | 2.82                          |
| Doctor degree                         | 7    | 1.86                          |

Intention to work abroad: 1-6 where 1=Extremely low intention to work abroad,  
6=Extremely high intention to work abroad

## Appendix 4: Overview of Dummy Variables – Reasons behind the Intention to Emigrate (pp.24)

Table 14.

*Overview of Binary Independent Variables for Reasons Behind the Intention to Emigrate*

| Reason                    | Explanation                                                                                             | Example answer                                                                                          | Variable name          | Mean         | St. dev      | Frequency |
|---------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------|--------------|--------------|-----------|
| Opportunities             | Seeking career opportunities.                                                                           | "Employment is better, many opportunities", "competition on the US job market is also relatively fair". | oppo_s<br>oppo_w       | 0.10<br>0.16 | 0.31<br>0.37 | 23<br>36  |
| International Exploration | Seeking foreign perspectives. Wanting to explore other cultures, history and other languages.           | "History, culture, football", "I want to explore other cultures"                                        | intexpl_s<br>intexpl_w | 0.30<br>0.13 | 0.46<br>0.34 | 67<br>29  |
| Developed Country         | Wanting to work in a more economically developed country.                                               | "Advanced science and technology", "The economy is good", "Efficient"                                   | develop_s<br>develop_w | 0.26<br>0.30 | 0.44<br>0.46 | 58<br>67  |
| Nature                    | Seeking to live in a calm country that is close to the nature                                           | "Beautiful scenery"                                                                                     | nature_s<br>nature_w   | 0.08<br>0.07 | 0.27<br>0.26 | 18<br>16  |
| Easy Adaption             | Seeking a culture that is close to what the respondent is used to, and keeping family and friends close | "Close to my parents", "It is my motherland", "Similar to China"                                        | easypd_s<br>easypd_w   | 0.10<br>0.41 | 0.29<br>0.49 | 21<br>91  |
| Political Environment     | The political system in destination region is an important driver.                                      | "Freedom of speech", "Democracy", "Sound legal system"                                                  | polenv_s<br>polenv_w   | 0.09<br>0.06 | 0.28<br>0.24 | 19<br>13  |
| Education System          | Seeking high-quality academic institution.                                                              | "They have the best universities", "The research environment is the best in the world"                  | edusy_s                | 0.38         | 0.49         | 82        |
| Low Living Cost           | Low cost is a driver of the intention. Low living costs, or tuition fee.                                | "Cost is not too high"                                                                                  | cheap_s                | 0.04         | 0.19         | 8         |
| Work Environment          | Seeking a country with a calm atmosphere and beneficial work conditions.                                | "The work environment is not as stressful as in China"                                                  | workenv_w              | 0.07         | 0.26         | 16        |
| Salary                    | Seeking the highest salary.                                                                             | "High salary"                                                                                           | sal_w                  | 0.09         | 0.28         | 19        |
| Growth Opportunities      | Seeking a country that has future growth potential.                                                     | "Prosperous"                                                                                            | growopp_w              | 0.05         | 0.22         | 11        |

The variable name *reason\_s* represents a reason behind the intention to study abroad. The variable *reason\_w* represents a reason behind the intention to work abroad.

## Appendix 5: Overview of Binary Independent Variables (pp.31)

Table 15: *Inclusion of variables in analytic framework*

| Reason                    | Push-Pull factor |                    | Neoclassical effect                                                                                              |
|---------------------------|------------------|--------------------|------------------------------------------------------------------------------------------------------------------|
|                           | China            | Destination region |                                                                                                                  |
| Opportunities             | –                | +                  | Increasing the <b>gain</b> of emigrating.<br><i>Example: career opportunities</i>                                |
| International exploration | –                | +                  | –                                                                                                                |
| Developed country         | –                | +                  | Increasing the <b>gain</b> of emigrating.<br><i>Example: Welfare benefits</i>                                    |
| Nature                    | –                | +                  | –                                                                                                                |
| Easy adoption             | +                | –                  | –                                                                                                                |
| Political environment     | –                | +                  | –                                                                                                                |
| Education system          | –                | +                  | Increasing the <b>gain</b> of emigrating.<br><i>Example: Meriting academic record increases expected salary.</i> |
| Low living cost           | +                | –                  | Increasing the <b>cost</b> of emigrating.<br><i>Example: Expensive tuition fee, high cost of living.</i>         |

Push-Pull Framework: +/– display attracting/repelling perception of China versus Destination region.  
Neoclassical Framework: Only variables directly affecting expected return of emigration will be included in the regression.

## Appendix 6: Correlation Matrix (pp.31)

Table 16. Correlation matrix for variables included in ordered probit regressions.

|                  | s_intention | wealthy | female | parents_academic | oppo_s | intexpl_s | develop_s | nature_s | cheap_s | easyad_s | potenv_s | edusys_s |
|------------------|-------------|---------|--------|------------------|--------|-----------|-----------|----------|---------|----------|----------|----------|
| s_intention      | 1.00        |         |        |                  |        |           |           |          |         |          |          |          |
| wealthy          | -0.17       | 1.00    |        |                  |        |           |           |          |         |          |          |          |
| female           | 0.14        | 0.07    | 1.00   |                  |        |           |           |          |         |          |          |          |
| parents_academic | -0.13       | 0.30    | 0.15   | 1.00             |        |           |           |          |         |          |          |          |
| oppo_s           | -0.04       | 0.10    | -0.01  | 0.13             | 1.00   |           |           |          |         |          |          |          |
| intexpl_s        | 0.18        | -0.03   | 0.04   | -0.13            | -0.16  | 1.00      |           |          |         |          |          |          |
| develop_s        | -0.03       | -0.06   | -0.17  | -0.06            | 0.01   | -0.15     | 1.00      |          |         |          |          |          |
| nature_s         | 0.15        | -0.18   | 0.15   | 0.02             | -0.10  | 0.05      | -0.11     | 1.00     |         |          |          |          |
| cheap_s          | -0.12       | 0.06    | -0.02  | 0.06             | -0.07  | -0.02     | -0.04     | 0.04     | 1.00    |          |          |          |
| easyad_s         | -0.44       | 0.16    | -0.02  | -0.05            | 0.00   | -0.14     | -0.17     | -0.09    | 0.19    | 1.00     |          |          |
| potenv_s         | 0.10        | -0.04   | 0.03   | 0.03             | -0.04  | -0.12     | -0.03     | -0.02    | -0.06   | -0.10    | 1.00     |          |
| edusys_s         | 0.14        | 0.11    | 0.13   | 0.12             | 0.11   | -0.26     | -0.23     | -0.19    | -0.05   | -0.22    | -0.12    | 1.00     |
| Observations     | 215         |         |        |                  |        |           |           |          |         |          |          |          |

## Appendix 7: Regression on Retaining Factors (Push-Pull) (pp.32)

Table 17.1.1 *Ordered probit regression. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value  |
|------------------------|-------------|----------|
| Wealthy                | -0,16       | (-1.00)  |
| Parents academic       | -0,18       | (-2.55)* |
| Female                 | 0,37        | (2.52)*  |
| Cheap                  | -0,15       | (0.36)   |
| Easy adoption          | -1,93       | (6.43)** |
| Number of observations | 215         |          |
| Wald chi2 (5)          | 60.69       |          |
| Prob>chi2              | 0.0000      |          |
| Pseudo R2              | 0.0829      |          |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 17.1.2 *Marginal effect. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | y=1    | y=2    | y=3    | y=4    | y=5     | y=6     |
|------------------------|--------|--------|--------|--------|---------|---------|
| Wealthy                | 0.01   | 0.02   | 0.02   | 0.01   | -0.01   | -0.04   |
| Parents academic       | 0.02*  | 0.02*  | 0.02*  | 0.01*  | -0.02*  | -0.05*  |
| Female                 | -0.03* | -0.04* | -0.04* | -0.01* | 0.03*   | 0.10*   |
| Cheap                  | 0.01   | 0.02   | 0.02   | 0.01   | -0.01   | -0.04   |
| Easy adoption          | 0.17** | 0.22** | 0.23** | 0.07*  | -0.16** | -0.52** |
| Number of observations | 215    |        |        |        |         |         |

Marginal effect. \*p<0.05; \*\*p<0.01

Table 17.2.1 *Ordered probit regression if wealthy=1. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value |
|------------------------|-------------|---------|
| Female                 | 0.25        | (0.32)  |
| Cheap                  | 0.94        | (0.20)  |
| Easy adoption          | -7.30       | (0.98)  |
| Number of observations | 78          |         |
| Wald chi2 (3)          | 57.43       |         |
| Prob>chi2              | 0.0000      |         |
| Pseudo R2              | 0.2099      |         |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 17.2.2 *Marginal effect if wealthy=1. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | y=1   | y=2   | y=3   | y=4   | y=5   | y=6   |
|------------------------|-------|-------|-------|-------|-------|-------|
| Female                 | -0.01 | -0.03 | -0.03 | -0.01 | 0.03  | 0.05  |
| Cheap                  | -0.04 | -0.11 | -0.12 | -0.04 | 0.13  | 0.18  |
| Easy adoption          | 0.32  | 0.89  | 0.91  | 0.31  | -1.03 | -1.41 |
| Number of observations | 78    |       |       |       |       |       |

Marginal effect. \*p<0.05; \*\*p<0.01

Table 17.3.1 *Ordered probit regression if wealthy=0. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value  |
|------------------------|-------------|----------|
| Female                 | 0.30        | (0.67)   |
| Cheap                  | -0.41       | (-0.75)  |
| Easy adoption          | -0.94       | (-2.49)* |
| Number of observations | 141         |          |
| Wald chi2 (3)          | 9.36        |          |
| Prob>chi2              | 0.0249      |          |
| Pseudo R2              | 0.0202      |          |

Ordered probit regression. \*p&lt;0.05; \*\*p&lt;0.01

Table 17.3.2. *Marginal effect if wealthy=0. Pull factors*

Dependent variable: Intention to study abroad

| Variable               | y=1   | y=2   | y=3   | y=4   | y=5    | y=6    |
|------------------------|-------|-------|-------|-------|--------|--------|
| Female                 | -0.03 | -0.03 | -0.05 | -0.01 | 0.02   | 0.09   |
| Cheap                  | 0.04  | 0.04  | 0.06  | 0.02  | -0.03  | -0.12  |
| Easy adoption          | 0.09* | 0.09* | 0.14* | 0.04  | -0.07* | -0.29* |
| Number of observations | 141   |       |       |       |        |        |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

## Appendix 8: Regression on Repelling Factors (Push-Pull) (pp.32)

Table 18.1.1 *Ordered probit regression. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | Coefficient | z-value  |
|---------------------------|-------------|----------|
| Wealthy                   | -0.32       | (-1.99)* |
| Parents academic          | -0,13       | (-1.84)  |
| Female                    | 0.24        | (1.61)   |
| Opportunities             | 0.08        | (0.33)   |
| International exploration | 0.66        | (3.73)** |
| Developed country         | 0.28        | (1.54)   |
| Nature                    | 0.70        | (2.37)*  |
| Political environment     | 0.74        | (2.71)** |
| Education system          | 0.67        | (3.89)** |
| Number of observations    | 215         |          |
| Wald chi2 (9)             | 40.63       |          |
| Prob>chi2                 | 0.0000      |          |
| Pseudo R2                 | 0.0555      |          |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 18.1.2. *Marginal effect. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | y=1     | y=2     | y=3     | y=4   | y=5    | y=6    |
|---------------------------|---------|---------|---------|-------|--------|--------|
| Wealthy                   | 0.04    | 0.04    | 0.03    | 0.01  | -0.3   | -0.08* |
| Parents academic          | 0.02    | 0.01    | 0.01    | 0.00  | -0.01  | -0.03  |
| Female                    | -0.03   | -0.03   | -0.03   | -0.01 | 0.02   | 0.06   |
| Opportunities             | -0.01   | -0.01   | -0.01   | 0.00  | 0.01   | 0.02   |
| International exploration | -0.08** | -0.07** | -0.07** | -0.01 | 0.07** | 0.17** |
| Developed                 | -0.03   | -0.03   | -0.03   | -0.01 | 0.03   | 0.07   |
| Nature                    | -0.08*  | -0.08*  | -0.07*  | -0.02 | 0.07*  | 0.18*  |
| Political environment     | -0.09*  | -0.08*  | -0.08*  | -0.02 | 0.08*  | 0.19** |
| Education system          | -0.08** | -0.07** | -0.07** | -0.01 | 0.07** | 0.17** |
| Number of observations    | 215     |         |         |       |        |        |

Marginal effect. \*p<0.05; \*\*p<0.0

Table 18.2.1 *Ordered probit regression if wealthy=0. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | Coefficient | z-value |
|---------------------------|-------------|---------|
| Female                    | 0,25        | (1,33)  |
| Opportunities             | -0,24       | (-0,75) |
| International exploration | 0,41        | (1,88)  |
| Developed country         | 0,04        | (0,19)  |
| Nature                    | 0,42        | (1,44)  |
| Political environment     | 0,45        | (1,45)  |
| Education system          | 0,26        | (1,18)  |
| Number of observations    | 141         |         |
| Wald chi2 (7)             | 10.16       |         |
| Prob>chi2                 | 0.1402      |         |
| Pseudo R2                 | 0.0236      |         |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 18.2.2 *Marginal effect if wealthy=0. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | y=1   | y=2   | y=3   | y=4   | y=5   | y=6   |
|---------------------------|-------|-------|-------|-------|-------|-------|
| Female                    | -0.02 | -0.02 | -0.04 | -0.01 | 0.02  | 0.07  |
| Opportunities             | 0.02  | 0.02  | 0.04  | 0.01  | -0.02 | -0.07 |
| International exploration | -0.04 | -0.04 | -0.06 | -0.02 | 0.03  | 0.12  |
| Developed                 | 0.00  | 0.00  | -0.01 | 0.00  | 0.00  | 0.01  |
| Nature                    | -0.04 | -0.04 | -0.06 | -0.02 | 0.03  | 0.13  |
| Political environment     | -0.04 | -0.04 | -0.07 | -0.02 | 0.04  | 0.14  |
| Education system          | -0.03 | -0.03 | -0.04 | -0.01 | 0.02  | 0.08  |
| Number of observations    | 141   |       |       |       |       |       |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

Table 18.3.1 *Ordered probit regression if wealthy=1. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | Coefficient | z-value  |
|---------------------------|-------------|----------|
| Female                    | 0,12        | (0,49)   |
| Opportunities             | 0,41        | (1,12)   |
| International exploration | 1,17        | (3,79)** |
| Developed country         | 0,52        | (1,72)   |
| Nature                    | -0,09       | (-0,09)  |
| Political environment     | 0,81        | (1,64)   |
| Education system          | 1,17        | (4,21)** |
| Number of observations    | 79          |          |
| Wald chi2 (7)             | 26.80       |          |
| Prob>chi2                 | 0.004       |          |
| Pseudo R2                 | 0.0981      |          |

Ordered probit regression. \*p&lt;0.05; \*\*p&lt;0.01

Table 18.3.2 *Marginal effect if wealthy=1. Push factors*

Dependent variable: Intention to study abroad

| Variable                  | y=1     | y=2     | y=3    | y=4   | y=5    | y=6    |
|---------------------------|---------|---------|--------|-------|--------|--------|
| Female                    | -0.02   | -0.01   | -0.01  | 0.00  | 0.02   | 0.02   |
| Opportunities             | -0.06   | -0.05   | -0.02  | 0.00  | 0.06   | 0.07   |
| International exploration | -0.18** | -0.14** | -0.06* | 0.00  | 0.17** | 0.21** |
| Developed                 | -0.08   | -0.06   | -0.03  | 0.00  | 0.07   | 0.09   |
| Nature                    | 0.01    | 0.01    | 0.01   | 0.00  | -0.01  | -0.02  |
| Political environment     | -0.12   | -0.10   | -0.04  | 0.00  | 0.12   | 0.15   |
| Education system          | -0.18** | -0.03** | -0.04* | -0.01 | 0.02** | 0.08** |
| Number of observations    | 79      |         |        |       |        |        |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

## Appendix 9: Regression on Expected Return (Neoclassical) (pp.32)

Table 19.1.1 *Ordered probit regression. Neoclassical framework*

Dependent Variable: Intention to study abroad

| Variable               | Coefficient | z-value  |
|------------------------|-------------|----------|
| Wealthy                | -0,35       | (0,03)*  |
| Parents academic       | -0,12       | (0,08)   |
| Female                 | 0,32        | (0,03)*  |
| Opportunities          | -0,10       | (0,66)   |
| Developed country      | 0,02        | (0,89)   |
| Education system       | 0,31        | (0,04)** |
| Cheap                  | -0,55       | (0,17)   |
| Number of observations | 215         |          |
| Wald chi2 (7)          | 20.42       |          |
| Prob>chi2              | 0.0047      |          |
| Pseudo R2              | 0.0279      |          |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 19.1.2 *Marginal effect. Neoclassical framework*

Dependent variable: Intention to study abroad

| Variable               | y=1    | y=2    | y=3    | y=4   | y=5    | y=6    |
|------------------------|--------|--------|--------|-------|--------|--------|
| Wealthy                | 0.04*  | 0.04*  | 0.04*  | 0.01  | -0.04* | -0.09* |
| Parents academic       | 0.02   | 0.01   | 0.01   | 0.00  | -0.01  | -0.03  |
| Female                 | -0.04* | -0.04* | -0.04* | -0.01 | 0.03*  | 0.09*  |
| Opportunities          | 0.01   | 0.01   | 0.01   | 0.00  | -0.01  | -0.03  |
| Developed country      | 0.00   | 0.00   | 0.00   | 0.00  | 0.00   | 0.01   |
| Education system       | -0.04  | -0.03  | -0.03* | -0.01 | 0.03*  | 0.09*  |
| Cheap                  | 0.07   | 0.06   | 0.06   | 0.01  | -0.06  | -0.15  |
| Number of observations | 215    |        |        |       |        |        |

Marginal effect. \*p<0.05; \*\*p<0.01

Table 19.2.1 *Ordered probit regression if wealthy=1. Neoclassical framework*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value  |
|------------------------|-------------|----------|
| Female                 | 0,27        | (1,09)   |
| Opportunities          | 0,00        | (0,00)   |
| Developed country      | 0,18        | (0,63)   |
| Education system       | 0,71        | (2,83)** |
| Cheap                  | -0,74       | (-1,26)  |
| Number of observations | 79          |          |
| Wald chi2 (5)          | 12.81       |          |
| Prob>chi2              | 0.0252      |          |
| Pseudo R2              | 0.0469      |          |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 19.2.2 *Marginal effect if wealthy=1. Neoclassical framework*

Dependent variable: Intention to study abroad

| Variable               | y=1    | y=2    | y=3    | y=4    | y=5    | y=6     |
|------------------------|--------|--------|--------|--------|--------|---------|
| Female                 | -0.05  | -0.03  | -0.02  | 0.00   | 0.04   | 0.05    |
| Opportunities          | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00    |
| Developed country      | -0.03  | -0.02  | -0.01  | 0.00   | 0.03   | 0.04    |
| Education system       | -0.12* | -0.09* | -0.04* | 0.00** | 0.11** | -0.14** |
| Cheap                  | 0.13   | 0.09   | 0.04   | 0.00   | -0.12  | -0.15   |
| Number of observations | 215    |        |        |        |        |         |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.0

Table 19.3.1 *Ordered probit regression if wealthy=0. Neoclassical framework*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value |
|------------------------|-------------|---------|
| Female                 | 0,26        | (1,45)  |
| Opportunities          | -0,32       | (-0,99) |
| Developed country      | -0,16       | (-0,74) |
| Education system       | 0,00        | (0,02)  |
| Cheap                  | -0,37       | (-0,69) |
| Number of observations | 141         |         |
| Wald chi2 (5)          | 4.87        |         |
| Prob>chi2              | 0.4324      |         |
| Pseudo R2              | 0.0105      |         |

Ordered probit regression. \*p&lt;0.05; \*\*p&lt;0.01

Table 19.3.2 *Marginal effect if wealthy=0. Neoclassical framework*

Dependent variable: Intention to study abroad

| Variable               | y=1   | y=2   | y=3   | y=4   | y=5   | y=6   |
|------------------------|-------|-------|-------|-------|-------|-------|
| Female                 | -0.03 | -0.03 | -0.04 | -0.01 | 0.02  | 0.08  |
| Opportunities          | 0.03  | 0.03  | 0.05  | 0.01  | -0.03 | -0.10 |
| Developed country      | 0.02  | 0.01  | 0.02  | 0.01  | -0.01 | -0.05 |
| Education system       | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Cheap                  | 0.04  | 0.04  | 0.06  | 0.01  | -0.03 | -0.12 |
| Number of observations | 215   |       |       |       |       |       |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

## Appendix 10: Factor Analysis (s.34)

Table 20. *Prediction of underlying factors in respect to reason variables*

| <b>Eigenvalue</b>             |                          |                          |                   |
|-------------------------------|--------------------------|--------------------------|-------------------|
| Factor 1                      | 0.70                     |                          |                   |
| Factor 2                      | 0.47                     |                          |                   |
| <b>Variable</b>               | <b>Factor 1 loadings</b> | <b>Factor 2 loadings</b> | <b>Uniqueness</b> |
| Opportunities                 | -0,26                    | 0,14                     | 0,91              |
| International exploration     | 0,40                     | -0,25                    | 0,78              |
| Developed                     | -0,10                    | 0,53                     | 0,71              |
| Nature                        | 0,25                     | 0,05                     | 0,93              |
| Cheap                         | 0,13                     | -0,06                    | 0,98              |
| Easy adaption                 | 0,22                     | -0,01                    | 0,95              |
| Political environment         | 0,08                     | 0,07                     | 0,99              |
| Education system              | -0,58                    | -0,31                    | 0,57              |
| <b>Number of observations</b> | 215                      |                          |                   |

Table 20.1.1 *Ordered probit regression. Factor 2*

Dependent variable: Intention to study abroad

| <b>Variable</b>        | <b>Coefficient</b> | <b>z-value</b> |
|------------------------|--------------------|----------------|
| Wealthy                | -0,34              | (-2,18)*       |
| Parents academic       | -0,12              | (-1,68)        |
| Female                 | 0,31               | (2,11)*        |
| Factor 2               | -0,17              | (-1,46)        |
| Number of observations | 215                |                |
| Wald chi2 (4)          | 16.14              |                |
| Prob>chi2              | 0.0028             |                |
| Pseudo R2              | 0.0220             |                |

Ordered probit regression. \*p<0.05; \*\*p<0.01

Table 20.1.2 *Marginal effect. Factor 2*

Dependent variable: Intention to study abroad

| <b>Variable</b>        | <b>y=1</b> | <b>y=2</b> | <b>y=3</b> | <b>y=4</b> | <b>y=5</b> | <b>y=6</b> |
|------------------------|------------|------------|------------|------------|------------|------------|
| Wealthy                | 0.05*      | 0.04*      | 0.04*      | 0.01       | -0.04*     | -0.09*     |
| Parents academic       | 0.02       | 0.01       | 0.01       | 0.00       | -0.01      | -0.03      |
| Female                 | -0.04*     | -0.03*     | -0.04*     | -0.01      | 0.03*      | 0.09*      |
| Factor 2               | 0.02       | 0.02       | 0.02       | 0.00       | -0.02      | -0.05      |
| Number of observations | 215        |            |            |            |            |            |

Marginal effect. \*p<0.05; \*\*p<0.01

Table 20.2.1 *Ordered probit regression if wealthy=1. Factor 2*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value |
|------------------------|-------------|---------|
| Female                 | 0,26        | (1,07)  |
| Factor 2               | -0,24       | (-1,18) |
| Number of observations | 79          |         |
| Wald chi2 (2)          | 3.31        |         |
| Prob>chi2              | 0.1909      |         |
| Pseudo R2              | 0.0121      |         |

Ordered probit regression. \*p&lt;0.05; \*\*p&lt;0.01

Table 20.2.2 *Marginal effect if wealthy=1. Factor 2*

Dependent variable: Intention to study abroad

| Variable               | y=1   | y=2   | y=3   | y=4  | y=5   | y=6   |
|------------------------|-------|-------|-------|------|-------|-------|
| Female                 | -0.05 | -0.03 | -0.02 | 0.00 | 0.05  | 0.05  |
| Factor 2               | 0.05  | 0.03  | 0.02  | 0.00 | -0.04 | -0.05 |
| Number of observations | 79    |       |       |      |       |       |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

Table 20.3.1 *Ordered probit regression if wealthy=0. Factor 2*

Dependent variable: Intention to study abroad

| Variable               | Coefficient | z-value |
|------------------------|-------------|---------|
| Female                 | 0,28        | (1,54)  |
| Factor 2               | -0,16       | (-1,13) |
| Number of observations | 141         |         |
| Wald chi2 (2)          | 4.01        |         |
| Prob>chi2              | 0.1345      |         |
| Pseudo R2              | 0.0087      |         |

Ordered probit regression. \*p&lt;0.05; \*\*p&lt;0.01

Table 20.3.2 *Marginal effect if wealthy=0. Factor 2*

Dependent variable: Intention to study abroad

| Variable               | y=1   | y=2   | y=3   | y=4   | y=5   | y=6   |
|------------------------|-------|-------|-------|-------|-------|-------|
| Female                 | -0.03 | -0.03 | -0.04 | -0.01 | 0.02  | 0.09  |
| Factor 2               | 0.02  | 0.02  | 0.02  | 0.01  | -0.01 | -0.05 |
| Number of observations | 141   |       |       |       |       |       |

Marginal effect. \*p&lt;0.05; \*\*p&lt;0.01

## Appendix 11: Survey Questionnaire in Mandarin

Q1: 您的性别：

男

女

Q2: 出生在哪个省？

Q3: 您的父母是什么学历？（选择其中最高的学历）

无学历

小学

初中

高中

学士学位

硕士学位

博士学位

其他学历。

Q4: 您的学历是什么？

高中

学士学位

硕士学位

博士学位

其他学历。

Q5: 您在读什么学科?／您打算读什么学科?

工程

经济

生态

社会

法律

医药

政治

其他学科。

Q6: 请排列以下国家，1号是您最感兴趣前往读大学的国家／地区是哪一个；6号是您最不感兴趣前往读大学的国家／地区是哪一个？假设你没有约束。

美国

加拿大

澳大利亚

中国

欧洲

另一个亚洲国家

Q7: 请写出选择这个最感兴趣的国家是为什么？

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Q8: 奖学金是很有必要的吗？为您出国去留学

全额奖学金

半额奖学金

不是必要

Q9: 请排列一下国家，当您毕业之后，1号是您最感兴趣前往工作的国家／地区是哪一个；6号是您最不感兴趣前往工作的国家／地区是哪一个。假设你没有约束。

美国

加拿大

澳大利亚

中国

欧洲

另一个亚洲国家

Q10: 请写出选择这个最感兴趣的国家是为什么？

---

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Q11: 如您毕业之后，想前往留下工作。多久时间您觉得想留下？假设你没有约束。

1-5年

6-10年

11-15年

15年多 (4)

我不想前往留下工作。

Q12: 请排列一下国家，当您毕业之后，1号是您觉得最容易找到工作的国家是哪一个；6号是您觉得最难找到工作的国家是哪一个？

美国 (1)

加拿大 (2)

澳大利亚 (3)

中国 (4)

欧洲 (5)

另一个亚洲国家 (6)

Q13: 您在外国留学过？

有

没有，但我想去

没有，没有兴趣出国留学

*If 有 is selected, then skip to* 请写出决定出去留学的原因是什么？

*If 没有, 但我想去 is selected, then skip to* 请写出决定出去留学的原因是什么？

*If 没有, 没有兴趣出国留学 then skip to* 我们感谢您花时间参加本调查。 您的回答已被记录

Q14: 请写出想出去留学的原因是什么？

---

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Q15: 如您会出国留学，什么方式是您的最感兴趣的？可以多项选择.

交换生

学士学位

硕士学位

博士学位

Q16: 您有多大的把握，您会出国留学？

很有信心

信心

不知道

没有信心

完全没有信心

Q17: 请写出决定出去留学的原因是什么？

→我们感谢您花时间参加本调查。 您的回答已被记录。

## Appendix 12: Survey Questionnaire in English

Q1: Gender

- Man
- Female

Q2: In what province were you born? \_\_\_\_\_

Q3: What is the highest academic degree that your parents have obtained? (Choose the parent with the highest academic degree).

- Primary school
- Intermediate stage school
- Upper school
- High school
- Bachelor degree
- Master degree
- Doctors degree
- Other level of education

Q4: What is your level of education?

- High school
- Bachelor
- Master
- Doctors
- Other level

Q5: What discipline are you currently studying/planning to study?

- Engineering
- Business/Economy
- Ecology
- Social sciences
- Law
- Medicine
- Politics
- Other discipline

Q6: Please rank the following countries where the first country/area is the one you are most interested in studying in, and the last is the country/area you are the least interested in studying in. Assume you have no constraints.

- USA
- Canada
- Australia
- China
- Europe
- Other Asian country

Q7: Please tell us why you are the most interested in studying in your first-choice country/area?

---

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Q8: What scholarship would be necessary for you to be able to study abroad?

- Full scholarship
- Half scholarship

Scholarship is not necessary

Q9: Please rank the following countries where the first country/area is the one you are most interested in working in after you have graduated from university, and the last is the country/area you are the least interested in working in after you have graduated from university. Assume you have no constraints.

USA  
Canada  
Australia  
China  
Europe  
Other Asian country

Q10: Please tell us why you are the most interested in working in your first-choice country/area?

---

---

Q11: If you would work abroad after graduating from university, how long do you think you would want to stay abroad? Assume you have no constraints.

1-5 years  
6-10 years  
11-15 years  
>15 years  
I don't want to work abroad. (0)

Q12: Please rank the following countries where the first country/area is the country where you think it is easiest to find a job, and the last is the country/area where you think it is the most difficult to find a job.

USA  
Canada  
Australia  
China  
Europe  
Other Asian country

Q13: Have you studied abroad before?

Yes  
No, but I want to  
No, I am not interested in studying abroad

*If "yes" is selected-->Q17*

*If "no, but I want to" is selected -->Q14*

*If "No, I am not interested in studying or working abroad" is selected -->We thank you for taking the time.....*

Q14: Please tell us why you want to study abroad?

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Q15: If you go to study abroad, what are you interested in studying?

Exchange semester  
Bachelor degree  
Masters degree  
Doctors degree

Q16: How confident are you that you will be able to go abroad to study?

Very confident

Confident

I do not know

Not confident

Not at all confident

Q17: Please tell us why you chose to study abroad?

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→ We thank you for taking the time.....