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High-level talent flow and its influence on regional unbalanced development in China

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ABSTRACT

Brain drain has long been a concern. However, little is known about the brain drain within a country. China is a developing country which is experiencing not only overseas brain drain but also a domestic cross-regional and cross-departmental flow. In this study, we investigate the flow of high-level talent (HLT) given the background of constructing world-class universities and disciplines (WCUDs) in China and its dynamic mechanisms, and then we discuss its potential implications. The results show that over the past four decades, eastern China has been a net-inflow area, and the northeastern and midwestern regions saw a net outflow. The eastern region shows more internal regional flow. Furthermore, a large amount of HLT has flowed from scientific research institutes to colleges and universities (CUs). Regional socioeconomic gaps, imperfect systems and inadequate management are the main reasons for the flow of HLT. Regional HLT flow is not as serious as expected, but irrational flow will probably aggravate the already interregional disparity in educational resources and human capital accumulation as well as regional unbalanced development. Therefore, some measures should be taken to fight irrational high-level talent flow.

1. Introduction

Brain drain, the diffusion of skilled human capital, is of concern to many countries and regions (Davenport, 2004; Pang, Lansang, & Haines, 2002). The term “brain drain” was first proposed by the British Royal Society, which referred to the migration of scientists and technologists from the United Kingdom to North American in the years after World War II (Cervantes & Guellec, 2002). Later, brain drain was used to refer to the mobility of the most highly skilled individuals in different regions, industries and occupation, including scientists, healthcare workers, engineers, and others with professional training (Bassioni, Adzaho, & Niyukuri, 2016; Gibson & Mckenzie, 2011).

High-skilled personnel tend to flow to areas with high levels of science and technology, liveable environments, sufficient funding for research and good salaries (Gibson & Mckenzie, 2011), which means that the developed countries (DCs) are the major destinations, while the less developed countries (LDCs) are major sources (Levy, 2003). Entering the 21st century, despite the existence of a new feature of global brain return and brain circulation (Lee & Kim, 2010; Mayr & Peri, 2009; Pellegrino, 2001; Saxenian, 2005), in which emerging economies are particularly prominent (Grogger & Hanson, 2011; Kerr, Kerr, Özden, & Parsons, 2017; Saravia & Miranda, 2004; Zweig, 2006), the overall trend is still the same. Statistics from the World Bank show that there are approximately 28 million high-skilled migrants living in Organization for Economic Cooperation and Development (OECD) countries in 2010, an increase of nearly 130% since 1990 (Kerr, Kerr, Ozden, & Parsons, 2016). With the development of globalization and multi-polarization, the flow of skilled persons will be more common and becomes an important aspect of globalization (Docquier & Rapoport, 2011; Pellegrino, 2001).

Brain drain has a significant impact on source and recipient countries (Carrington & Detragiache, 1999). For the source countries, particularly developing countries, brain drain worsens the situation of stretched talent because of the long-existing limitations in society and economy and decreases the accumulation of human capital (Gibson & Mckenzie, 2011; Johnson, 2005; Okeke, 2013). The emigration of professional talent, no matter permanent or temporary, affects economic development and increases inequality in the global distribution of income (Beine, Docquier, & Rapoport, 2001; Kancs, 2011; Mountford & Rapoport, 2011; Wei, Yi, & Zhang, 2015; Wong & Chong, 1997), thus

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weakening a country's international competitiveness (Tung, 2008). This further exacerbates brain drain, causing a vicious circle. The universality of brain drain plays an important role in the young generation's intentions to migrate, giving impetus to the emigration of the young (Lisa et al., 2008). Meanwhile, many young students studying abroad do not intend to return home after completing their tertiary education, constituting a specific type of brain drain (Dako-Gyeke, 2015, 2016; Soon, 2009, 2012). However, because there are still many relatives in hometowns, skilled migrants have close ties with their home countries and send remittances to support families (Bollard, Mckenzie, Morten, & Rapoport, 2011; Gibson & Mckenzie, 2011), which increases the homeland's foreign exchange reserves. At the cross-country level, these professional migrants combine the market advantages of the source countries and the technological advantages of the recipient countries. They can contribute to industrial structure upgrading and local socioeconomic development (Gibson & Mckenzie, 2011; 2012; Saxenian, 2005). Additionally, by obtaining better training abroad, brain return becomes an important source of human capital formation and accumulation in source countries (Dustmann, Fadlon, & Weiss, 2011; Mayr & Peri, 2009). For the recipient countries, skilled people often have high comprehensive quality, age advantages, and educational attainment. Brain gain plays a positive role in improving the quality of the population and meets the demand for high-quality workers (Li, 2007; Oommen, 1989). There are serious issues with ageing populations and low birth-rates in recipient countries (Cromley, Wilson-Genderson, Christman, & Pruchno, 2015; Sobotka, 2009), skilled immigration helps to alleviate this situation, since most immigrants are young or middle-aged (Banerjee, 2010; Editoral, 2011; Mok & Han, 2016). In addition to global, cross-regional or cross-national mobility, the internal flow of talents within a region and country is also obvious, especially in the United States (George, Borjas, & Bronars, 1992; Ottaviano & Peri, 2012; Partridge, Rickman, Olfert, & Ali, 2012; Walker, Ellis, & Barff, 1992), British (Gagliardi, 2015), Germany (Parikh & Van Leuvensteijn, 2003), Austria (Tang, Rowe, Corcoran, & Sigler, 2014), Taiwan (Lan, 2011) and China (Fu & Gabriel, 2012; Han & Li, 2017; Liu & Shen, 2014; Liu, Shen, Xu, & Wang, 2017). Given the dominant position of the city in high-skilled employment, most migrants choose cities as their destinations (Tang et al., 2014). However, due to the cultural differences between source and recipient countries, brain migration likely brings new problems, i.e., racial discrimination and crime, which may hinder the social inclusion of immigrants and lead to social instability (Li, 2007).

Like other countries in the world, China is also a country with high brain drain (Tian & Fang, 2014), and it has attracted widespread attention. However, most of the studies only qualitatively describes the status of domestic talent flow (Li, 2005; Luo, Luo, & Wu, 2002; Zheng & Li, 2000; Zou & Dong, 2015), few studies have quantified the level and pattern of brain drain. Importantly, to enhance the comprehensive strength and international competitiveness of China's higher education system, the Chinese government introduced an overall plan to construct world-class universities and disciplines (WCUDs) on October 24, 2015.[1] This will lead to talent recruitment and talent flow among CUs across the whole country, and the CUs in midwestern and northeastern China have become a severely afflicted area of brain drain (Du & Tao, 2000). At present, an important criterion for Chinese WCUDs is largely measured by the amount of high-level talent (HLT).[2] The introduction of the "title-type" talents among CUs may form a vicious circle and exacerbate domestic brain drain. Thus, it is urgent that the talent distribution pattern and flow situation should be fully investigated to provide references for policymakers in China. Using a dataset of HLT over the period of 1980–2016, this study explores the spatial pattern of high-level talent flow in China and reveals its mechanism and potential influences. These findings will provide a scientific basis to further guide the flow of talent and education development in China and beyond in the future.

2. Materials and methods

2.1. Materials

In China, there are various national talent projects, such as the National High-level Talents Special Support Programme, which is run by the Organization Department of the Central Committee of Communist Party of China (CPC), and the Chang Jiang Scholars Program, which is run by the Ministry of Education.[3] According to the programme length and nationwide recognition for high-level talents, we have included five types of talents in this study, i.e., the academicians of Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE), and candidates of the Ministry of Education's "Chang Jiang Scholars Program" (CJSP), the Thousand Talents Programme (TTP), the Ten-Thousand Talents Programme (TTTP) and the National Science Fund for Distinguished Young Scholars (NSFDYS). The electoral work of the academicians of CAS began in 1955, but the earliest selected year for the academicians who are still alive is 1980. The electoral work of the academicians of CAE began in 1994. The appointment of the YRAS, TTP, TTTP and NSFDYS began in 1998, 2012, 2008 and 1994, respectively. Therefore, the study period is 1980–2016, and this number excludes HLT who have deceased or committed a crime, academic misconduct or other actions that led to dismissal between 1980 and 2016.

The numbers of the academicians of CAS and CAE are collected from the CAS[4]and the CAE.[5] Since 1955, when the Faculty of Chinese Academy of Sciences (CAS) was established, and 1994, when the first batch of CAE's academicians was selected, there have been 2312 Chinese scientists and 162 foreign scientists been selected as academician, and there are 1562 Chinese academicians and 124 foreign academicians still alive. The data for the NSF for the Distinguished Young Scholars was available from the National Natural Science Foundation of China.[6] Excluding those who have deceased or emigrated, there are 3575 young scholars in China who have received the NSFDYS. The data on the "Chang Jiang Scholars Program", containing distinguished professors and chair professors, is accessible at the Ministry of Education of the People's Republic of China. Excluding those who have deceased or emigrated, there are 3050 professors enrolled in CJSP. The source for data for the Thousand Talents Programme and Ten-Thousand Talents Programme is the Organization Department of the Central Committee of the CPC. The recruitment of global experts has reached nearly 4000 since the implementation of the TTP in 2008, and the Chinese government has selected and supported 1936 HLT since the implementation of the TTTP in 2012.

2.2. Methods

In this study, we defined the irrational flow of talents as the flow that does not fully meet the needs of socioeconomic development, which leads to the imbalance of human capital and the inefficient use of human resources in different regions (Liu & Zhou, 2004). It is the result of the vicious competition between different regions or institutions and does not meet the needs of the development of the market economy (Liu & Zhou, 2004; Peng, 2015). For examples, the supply of talents is

[1] http://www.gov.cn/zhengce/content/2015-11/05/content_10269.htm.

[2] HLT include the academicians of Chinese Academy of Sciences (CAS) and Chinese Academy of Engineering (CAE), the candidates of the Ministry of Education "Chang Jiang Scholars Program", the Thousand Talents Program, the Ten-Thousand Talents Program and the National Science Fund for Distinguished Young Scholars.

[3] http://hr.ncut.edu.cn/rsc/50/20151230/110110205228112.html.

[4] http://casad.cas.cn/chnl/371/index.html.

[5] http://www.cae.cn/cae/jsp/qtysmd.jsp?ColumnID=135.

[6] http://www.nsfc.gov.cn/publish/portal0/tab315/.