

The best are yet to come: State Programs, Domestic Resistance and Reverse Migration of High-  
Level Talent to China

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## Introduction<sup>1</sup>

All developing countries suffer an ongoing brain drain, and while discussions of the “brain gain” and “brain circulation” reflect the positive perspective that a significant flow of human talent has been flowing back to some developing countries. However, we know little about the quality of the returnees as compared to those who remain abroad. Moreover, today many states invest significant resources in trying to attract their own nationals living abroad to return in the hope that they will transfer the skills and knowledge they have gained overseas. In fact, national development is now often discussed in terms of the global competition for talent, or a state’s human capabilities, or a global “talent war.”<sup>2</sup>

Therefore, this paper seeks to answer two key questions.

First, are government resources actually bringing back the best talent? Or do the best still remain abroad? But should they remain abroad, are the best still engaged with their homeland, in some meaningful way, transferring important knowledge, in line with the “Diaspora Option?”<sup>3</sup>

Second, if “the best are yet to come,” why is this so? What keeps them abroad? Perhaps investing resources are not enough and major a transformation of norms and attitudes among national leaders, the leaders of academic and research institutes and among homegrown academics, is necessary before the best will return.

This paper, therefore, assesses the quality of returnees under three national programs in China for recruiting overseas talent, comparing the quality of returnees in the three programs as well as comparing these returnees to the very best Chinese scholar/scientists who remain abroad.

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<sup>1</sup> Financial support from Research Grants Council of Hong Kong, Chang Tseng-Hsi Foundation and the School of Humanities and Social Science, The Hong Kong University of Science and Technology.

<sup>2</sup> Herbert Brücker, et. al. (eds), *Brain Drain and Brain Gain: The Global Competition to Attract High-Skilled Migrants* (Oxford University Press, 2012)

<sup>3</sup> Jean-Baptiste Meyer, Charum, Jorge; Bernal, Dora, Gaillard, Jacques; Granes, José; Leon, John; Montenegro, Álvaro; Morales, Álvaro, Murcia, Carlos; Narváez-Berthelemot, Nora; Parrado, Luz Stella; Schlemmer, Bernard. 1997. “Turning brain drain into brain gain: The Colombian experience of the diaspora option,” *Science, Technology and Society*, Vol. 2, No. 2 (1997).

It finds that the Mainlanders who have remained abroad and are not currently participating in national programs are the best researchers, as measured by the quality of their journal publications. Second, scholars who remain abroad and participate only part-time in the “Thousand Talents Plan,” which was established in 2008 by the Chinese Communist Party (CCP), are superior to participants in this same program who have returned to China fulltime, and better than both full- and part-time participants in the Changjiang Scholars Program, established by the Ministry of Education. And the quality of scholarly publications of full-time and part-time scholars under both the 1000 Talents and Changjiang Scholars programs surpass the quality of the recipients of the Hundred Talents Program award given by the Chinese Academy of Sciences (CAS). We also show that returnees to CAS under the previous two programs publish in higher quality journals than those who return to China and join CAS under CAS’ own 100 Talents Plan.

Second, in order to explain why the best are not returning, we compare university presidents with different types of overseas experiences—recipients of overseas PhDs, those who went abroad as Visiting Scholars, and those with no foreign experience—as well as the manner in which they were promoted to leadership positions. Our findings show that university presidents with less international experience dominate bring back less world-class talent than presidents with a foreign PhD. Also, university presidents who were promoted internally, rather than being brought in from outside the school, are also less likely to attract world class talent. These findings suggest that developing states seeking to bring home the best and brightest may need to internationalize their research and academic culture.

### **The Role of the State**

To enhance the reverse flow of human talent, states must increase the salaries paid to reverse migrants. A study of competition for talent among OECD countries found that wage

differentials among the countries significantly affected the flow of human talent.<sup>4</sup> They must also improve the hardware, that is, the R&D component of the economy. Quoting Saravia and Miranda, “when real opportunity exists within the context of coherent internal policies and investments in science and technology, returning to the home country becomes an attractive option for emigrants.”<sup>5</sup> Analysts also admonish developing states to improve the software, such as the scientific environment, laws and regulations that can negatively affect return migration. According to the OECD, sending countries must “develop an adequate scientific, technological and business environment that will provide rewarding opportunities for the return of individuals who have upgraded their skills abroad.”<sup>6</sup> Similarly, Newland believes that to facilitate circular migration, governments must at a minimum create an “enabling environment in the country of origin,” the most important being the “establishment of the rule of law, property rights, open and transparent government, lack of corruption and other attributes of good governance, including dual citizenship or eliminating visa requirements for members of the diaspora who are citizens of another country.”<sup>7</sup>

Yet reverse migration programs confront serious institutional resistance, as do those who try to return, based largely on “bias” against returnees at the national, institutional or individual level. Relocating people, values, talent, and knowledge to the home country alters the distribution of power, ideas, status and resources within it.<sup>8</sup> For Cerase, the ability of returnees to bring about change may be limited “because of the resilience of strong power relations and vested interests which prevent innovators from undertaking any initiatives that could jeopardize the established

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<sup>4</sup> Herbert Brücker, Simone Bertoli, Giovanni Facchini, Anna Maria Mayda, and Giovanni Peri, “The Determinants of Highly Skilled Migration: Evidence from OECD Countries 1980–2005,” Brücker, et. al. (eds), *Brain Drain and Brain Gain*.

<sup>5</sup> Nancy Gore Saravia and Juan Francisco Miranda, “Plumbing the brain drain,” *Bulletin of the World Health Organization*, no. 82 (2004): 608-615.

<sup>6</sup> OECD Observer, “International Mobility of the Highly Skilled,” *Policy Brief*, July 2002.

<sup>7</sup> Kathleen Newland, *Circular Migration and Human Development*, Human Development Research Paper, no. 42 (New York: United Nations Development Programme, 2009).

<sup>8</sup> Devesh Kapur, *Diaspora, Development and Democracy: the domestic impact of international migration from India* (Princeton, UP, 2010).

situation and the traditional power structure.”<sup>9</sup> A survey in 2002 and 2003 in the Chinese Academy of Sciences showed a clear “institutional bias” among local scientists against returnees.<sup>10</sup> According to Solingen, “firewalls” in the home country limit external influences that would facilitate the type of changes that people overseas would want to see before they would consider returning.<sup>11</sup> In fact, if dominant domestic norms differ strongly from norms they learned abroad, returnees may be forced to assimilate or fail.<sup>12</sup> Thus the greater the ability of locals to resist such changes, the lower the probability that they will face threats from more talented overseas scholars.

Institutional resistance to educational reforms occurs worldwide. When Germany tried to encourage competition among universities,<sup>13</sup> 4,000 faculty members signed a letter opposing reform which tried to “curb the pervasive powers of senior professors” by “providing more freedom and financial incentive for junior ones.”<sup>14</sup> In Turkey, systematic and institutional barriers resisted efforts by academic returnees to change the curriculum or the research environment.<sup>15</sup> The president of Istanbul Technology University, who possessed an American PhD, was challenged by recent PhDs who resented his decision to prevent them from transitioning into tenure track positions in the university.<sup>16</sup> In China, the failed reform effort by the president and party secretary at Peking University in 2003 is legendary.<sup>17</sup>

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<sup>9</sup> F. P. Cerase, “Expectations and reality: a case study of return migration from the United States to Southern Italy,” *International Migration Review*, vol. 8, no. 2 (1974): 245-62.

<sup>10</sup> David Zweig “Hui dao Zhongguo kexueyuan: xiqu, huanjing yu ciji” (Returning to the Chinese Academy of Sciences: Shortage, Environment and Incentives), *Zhongguo haigui fazhan baogao* (Report on the Development of China’s Returnees; Shehui kexue wenxian chubanshe [Social Sciences Press], No. 2 (2013), pp. 133-165.

<sup>11</sup> Etel Solingen, “Of Dominoes and Firewalls: The Domestic, Regional, and Global Politics of International Diffusion,” *International Studies Quarterly*, 56 (2012): 631-44.

<sup>12</sup> David Zweig and Feng Yang, “Overseas Students, Returnees and the Diffusion of International Norms into Post-Mao China,” *International Studies Review*, 16 (Fall 2014): 252-63.

<sup>13</sup> Bleiklie and Lange, 2010

<sup>14</sup> Jäger and Schiermier, 2001

<sup>15</sup> Celik, 2012.

<sup>16</sup> Interview by Zweig in Istanbul, April 2015.

<sup>17</sup> Chinese Education

## The Role of the Chinese State in Bringing Back Talent

The Chinese state has been highly active and relatively successful in recruiting overseas talent.<sup>18</sup> One explanation is the jump in R&D investment by the state, which in the new millennium has increased 23.1% (table 1).

Table 1. China's R&D Investment, 2001-2014

|   | 2001          | 2002          | 2004          | 2005          | 2007          | 2009          | 2010          | 2011          | 2012         | 2013         |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|
| <b>China's R&amp;D Spending</b>           | <b>1042.3</b> | <b>1287.6</b> | <b>1966.3</b> | <b>2450.0</b> | <b>3710.2</b> | <b>5802.1</b> | <b>7062.6</b> | <b>8687.0</b> | <b>10298</b> | <b>11846</b> |
| <b>China's Percent Growth</b>             | <b>14.1%</b>  | <b>22.8%</b>  | <b>19.5%</b>  | <b>19.9%</b>  | <b>14.8%</b>  | <b>26.5%</b>  | <b>21.7%</b>  | <b>23.0%</b>  | <b>18.5%</b> | <b>15.0%</b> |
| <b>R&amp;D Spending as Percent of GDP</b> |               |               |               |               |               |               |               |               |              |              |
| <b>China</b>                              | <b>0.95%</b>  | <b>1.07%</b>  | <b>1.23%</b>  | <b>1.32%</b>  | <b>1.40%</b>  | <b>1.70%</b>  | <b>1.76%</b>  | <b>1.84%</b>  | <b>1.98%</b> | <b>2.01%</b> |
| <b>Japan</b>                              | <b>3.07%</b>  | <b>3.12%</b>  | <b>3.13%</b>  | <b>3.31%</b>  | <b>3.46%</b>  | <b>3.36%</b>  | <b>3.25%</b>  | <b>3.38%</b>  | <b>3.34%</b> | <b>3.47%</b> |
| <b>South Korea</b>                        | <b>2.34%</b>  | <b>2.27%</b>  | <b>2.53%</b>  | <b>2.63%</b>  | <b>3.00%</b>  | <b>3.29%</b>  | <b>3.47%</b>  | <b>3.74%</b>  | <b>4.03%</b> | <b>4.15%</b> |
| <b>USA</b>                                | <b>2.64%</b>  | <b>2.55%</b>  | <b>2.49%</b>  | <b>2.51%</b>  | <b>2.63%</b>  | <b>2.82%</b>  | <b>2.74%</b>  | <b>2.76%</b>  | <b>2.70%</b> | <b>2.74%</b> |
| <b>Taiwan</b>                             | <b>2.02%</b>  | <b>2.10%</b>  | <b>2.26%</b>  | <b>2.32%</b>  | <b>2.47%</b>  | <b>2.84%</b>  | <b>2.80%</b>  | <b>2.90%</b>  | <b>2.95%</b> | <b>3.01%</b> |
| <b>European Union</b>                     | <b>1.70%</b>  | <b>1.71%</b>  | <b>1.67%</b>  | <b>1.67%</b>  | <b>1.70%</b>  | <b>1.84%</b>  | <b>1.84%</b>  | <b>1.88%</b>  | <b>1.92%</b> | <b>1.93%</b> |

China's various ministries, as well as the Chinese Communist Party's Organization Department,<sup>19</sup> have instituted more than a dozen programs granting special privileges to returnees,

<sup>18</sup> Zweig, ILO

including high salaries, better housing, bi-lingual schools for children, jobs for spouses, relocation funding, long-term resident permits for Mainlanders holding foreign passports, large start-up funding grants, rapid promotions, etc.<sup>20</sup> The state sees well-funded returnee programs as a shortcut to improving domestic capabilities and enhancing the state’s development,<sup>21</sup> although Chinese actively debate about policies to attract better returnees.<sup>22</sup>

This paper focuses on three prominent programs: the 100 Talent Plan under the Chinese Academy of Sciences (CAS), the Changjiang Scholars plan under the Ministry of Education (MoE), and the academics and researchers who have returned to universities and CAS under the CCP’s 1000 Talent Plan.<sup>23</sup> Each of these programs involves different strategies, incentives and level of funding (table 2), and both the 1000 Talents Plan and the Changjiang Scholars Plan offered both full-time and part-time programs.

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Table 2. Subsidies of the Three National Talent Programs

| Program           | Research Fund | Settlement Allowance | Extra Salary                      | Apartment |
|-------------------|---------------|----------------------|-----------------------------------|-----------|
| 100 Scholars Plan | > 2 mil. RMB  | 800,000 – 9 mil. RMB | 2000 RMB/mo. totaling 400,000/yr. |           |

<sup>19</sup> David Zweig and Henry Wang, “Can China Bring Back the Best? The Communist Party Organizes China’s Search for Talent,” *The China Quarterly*, no. 215 (September 2013): 590-615.

<sup>20</sup> Luo and Ping, 2003; Cao, 2009.

<sup>21</sup> *People’s Daily*, 29 August 2014.

<sup>22</sup> Xinhuanet, 2012.

<sup>23</sup> We do not analyze the entrepreneurs returning under the 1000 Talent’s Plan, as our measure of success is the quality of their publications, something few entrepreneurs care about.

|                                      |                          |                         |                          |                                  |
|--------------------------------------|--------------------------|-------------------------|--------------------------|----------------------------------|
| <b>Cheung Kong Scholar full time</b> | Usually > 2,000,000 RMB* | 500,000 – 1,000,000 RMB | 200,000 RMB/year         | 100-200 m <sup>2</sup> Apartment |
| <b>Cheung Kong Scholar part time</b> | Approx. 300,000 RMB      | None                    | 30,000/mo. when in China | usage                            |
| <b>1000 Talents Plan Full Time</b>   | 3.5 mil RMB              | 1 – 1.5 mil. RMB        | 400,000 RMB/year         |                                  |
| <b>1000 Talents Plan Part Time</b>   | 500,000 RMB              | None                    | 30,000 RMB/mo. in China  | usage                            |

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The CAS has sent scientists abroad since 1978, so in 1995 it introduced its own program to bring people back, the 100 Scholars program, which was the first program to attract attention overseas. In 1998, the American Chemistry Society stated that CAS was attempting to attract fresh blood into its institutes through its "hundred young scientists project."<sup>24</sup> The 100 Scholars Program offers each returnee a package up to 2 million RMB, which was a huge sum in the late 1990s.<sup>25</sup>

<sup>24</sup> American Chemistry Society, 1998.

<sup>25</sup> Zhang, 2014.

The Changjiang Scholars Program has its roots in then President Jiang Zemin's speech honoring Peking University's 100<sup>th</sup> anniversary. To fulfill the task of "establishing world-class universities" and achieve China's modernization,<sup>26</sup> the MoE launched the "985 Program" and "Changjiang Scholar Program." The first wave of funding went to nine top universities and required that 20 percent of those funds be used to improve the quality of the faculty by importing overseas talent.<sup>27</sup> The Changjiang Scholar Program, which received support from Hong Kong tycoon Lee Kai-Shing, offers a competitive salary to overseas returnees and an annual subsidy of 200,000 RMB per year (US\$25,000) over their wage.<sup>28</sup> The early version of the plan required that returnees work full time in China, which meant returning permanently. But eventually, the returnees fell into two categories; (1) Distinguished Professors (*Tepin jiaoshou*), who were full time returnees, and (2) Chair Professors (*jiangzuo jiaoshou*) who were part-time professors. Between 1998 to 2002, the ratio was eleven to one (488 vs 43), with fewer part-time returnees. But after the quota for part-time returnees increased, the ratio in 2003 between full- and part-time returnees jumped to 3:2 (901 to 615 through 2003).

Finally, in February 2008, the Organization Department of the CCP announced the "1000 Talents" Program. Under this plan, returnees are granted "permanent residence status for aliens" and/or multiple entry-exit visas good for two to five years. Employers must guarantee a returnee's spouse a job and arrange admission to top kindergarten/schools for their children. Returnees receive a one-time subsidy of RMB 1 million and are entitled to medical care and social insurance. Their salary, which is not restricted, is to be negotiated with employers in light of their previous salary overseas.<sup>29</sup> Initially, all returnees were to spend a minimum of six months per year on the job in China, but with the program undersubscribed, it, too, established a part-time option

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<sup>26</sup> Jiang, 1998.

<sup>27</sup> David Zweig, "Learning to Compete: China's Efforts to Encourage a Reverse Brain Drain," *International Labour Review*, vol. 145, nos. 1-2 (2006): 65-90.

<sup>28</sup> Guangming Daily, 1998.

<sup>29</sup> Zweig and Wang, 2013

which quickly became quite popular, creating a form of “brain circulation”<sup>30</sup> rather than true reverse migration. Among the original 501 people joining the program by 2011, 74.7% were academics and researchers, among whom over 73.5% were part-time participants.<sup>31</sup>

Having established the fact that many people are not returning full-time, we turn to the question of “so what?” Is there a significant difference between those who return full-time and the part-time returnees? Are the best researchers being pulled back by these national programs? And if not, are these programs encouraging the better researchers to come to China and share their experiences? If the quality of the work of full time returnees equals that of the part-timers, China need not be concerned. However, if part-time returnees are better researchers than full-time returnees, we may conclude that China’s program faces serious problems. Moreover, what if the best people are those who remain abroad and do not participate in national programs at all?

To answer these questions, we proposed the following hypotheses.

*H1. The quality of the people who have not returned full-time, but maintain an academic post overseas are better than those who have returned full-time.*

There are several reasons this hypothesis may be true. People who retain overseas connections may participate in better projects, are less involved in cumbersome administrative affairs in China, and publish more in international journals than researchers who return full time.

*H2. The quality of talent at universities has surpassed the talent at the Chinese Academy of Sciences.*

Researchers today prefer top universities over CAS, even though CAS’ 100 Talents Plan is more generous than the Changjiang Scholars Plan. Also, the criteria for joining the Changjiang Scholars and the 1000 Talents Plan are more competitive than CAS’ 100 Talents Plan, as the latter

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<sup>30</sup> AnnaLee Saxenian, with Yasuyuki Motoyama and Xiaohong Quan, *Local and Global Networks of Immigrant Professionals in Silicon Valley* (San Francisco, CA: Public Policy Institute of California, 2002).

<sup>31</sup> Wang and Zweig, 2011.

involves only internal vetting while the former two programs rely on panels of global experts to determine admission to the program.

*H3. The best Mainland researchers working abroad who have not joined national programs are better than those who have joined national programs.*

Why would this be possible? First, the very best people overseas may not feel the need to embellish their CVs by gaining the imprimatur of a government program. Second, part-time programs involve a time commitment that the best overseas talent may not be able to afford. They may be willing to help China, send in research teams and establish joint projects, but the most talented may be unwilling commit the three months required under part-time schemes.<sup>32</sup> Moreover, having spent many years abroad, they do not want to engage in the somewhat unscrupulous behavior of taking funds without salary and funding from the Chinese government contributing the expected amount of time.<sup>33</sup> Second, overseas academics may not want to be seen taking funds from the CCP. And third, joining a national program part time, may cause Western colleagues and administrators to wonder if the scholar is contemplating returning full time.

### Data

To test these hypotheses we collected the CVs of all the participants in these three national programs that we could find online. Collecting the total population of participants in national programs was not easy but we have collected a large proportions of the respective populations. For example, even though our request for a list of CAS' 100 Scholar Awardees was rejected due to "confidentiality," we did get about 25% of the program's awardees. As for the 1000 Talents awardees, while many part-time participants do not want their participation publicized, so their names do not appear on their university's website, having 1000 Talents awardees at one's school

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<sup>32</sup> A top researcher at York University in Toronto, who had once been a part-time Changjiang Scholar, was no longer directly involved in any government program, though he had numerous exchanges with institutions in China. Interview in summer 2015.

<sup>33</sup> Interviews in Toronto by Zweig, June 2015.

reflects the school's quality, so many institutions do list their awardees. Finally, it is possible that part-time participants overseas may not have wanted their overseas institution to know of their potential divided loyalty, so they did not list their participation on their overseas CVs, even though were participating.

Nevertheless, by searching on academic forums and university websites, we established a state-program returnee database covering 1,368 high-end returnees.<sup>34</sup>

### **Sampling Method**

Our 100 Scholar awardees come from two periods. One group covers 298 scholars who joined the program before 2009. Their names were collected from CAS reports which suggest that over 1200 awards were given out before 2009. However, while no full name list of the 1200 is available, the 298 CVs we found represented 25% of the participants.

The second group of 100 Scholars includes 110 awardees who received the award in 2011 and 2012, who applied for "further Hundred Scholar support in 2013," thereby representing the best awardees in 2011 and 2012.<sup>35</sup> And if we estimate that about 450 scientists received this award in 2011-12, these 110 awardees again represent 25% of that population.

The names of all 2,337 recipients of the Changjiang Scholar award – both full- and part-time--are published online. Drawing on the full name, we randomly selected 248 people (10.6%) and downloaded their CVs. While most worked in universities, some also worked at CAS.

According to our calculation, 1,723 scientists and academics have been awarded full- or part-time 1000 Talent awards under the Innovation Scheme.<sup>36</sup> The majority work in universities

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<sup>34</sup> Research was carried out at the South China International Talent Institute in Guangzhou, where Wang is Dean and Zweig is Honorary Associate Dean. Kang Siqin supervised the data collection.

<sup>35</sup> We estimate that the number of Hundred Scholars in 2011 and 2012 is 450.

<sup>36</sup> There are four different types of Thousand Talent schemes: Innovation scheme, Entrepreneurship scheme, Young Talent and Foreign Talent. The Innovation scheme targets specifically Chinese overseas academicians (including scientists working in the research laboratory of companies).

but some are employed by CAS. However, while the full list is not public, universities enthusiastically publicize the names of 1000 Talent awardees in their university, giving us a yield of 733. The distribution of our awardees is listed in table 3.

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Table 3. Our Sample of the National Talent Programs

| Program                 | Sample Size | Total No. of Awardees | Sample as percent of awardees |
|-------------------------|-------------|-----------------------|-------------------------------|
| 100 Scholars (pre-2009) | 298         | 1200                  | 24.8%                         |
| 100 Scholars (2011-12)  | 110         | 450*                  | 24.4%                         |
| Changjiang Scholars     | 248         | 2337                  | 10.6%                         |
| 1000 Talent Plan        | 733         | 1723                  | 42.5%                         |

\*By author's estimation.

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### **Variables of Returnee Data**

Our China returnee data (table 5) drew the following variables from the scholar's CV, department or personal website, the website of their laboratory, or newspaper reports.

- *Demographic information* includes age, gender and home province.
- *Education Background* includes when and where they obtained their degrees as well as the field of their doctoral study.
- *Return related information* includes the *year of return* (the year they accepted a formal position in China), *year joining the program*, *first work unit* they joined after returning, the *work unit* –i.e., where they worked when awarded the award, their *academic position* and any *administrative position* they obtained in their first work unit.
- *Work experience* covers six variables: when and where they finished their post-doc

training; the last (current)<sup>37</sup> university and department they were/are working overseas before returning,<sup>38</sup> the last academic and administrative position they held before returning, and their current post in China.

- *Publication and Average Annual Impact Factor (AAIF)*: We recorded all the journal articles written by our scholars,<sup>39</sup> including the title of the articles, the year of publication, the journal title, the impact factor of the journal in 2014, whether they were first or corresponding author, or whether they were the single author. Based on the impact factor of the journal (in 2014), we calculated the average annual impact factor of each returnee.<sup>40</sup> While using such a measure may ignore their overall scientific, commercial and social contribution, this is the least biased and empirically the easiest variable to measure that can compare each individual uniformly.<sup>41</sup>

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**Table 4. Descriptive statistics for returnee data**

| Variable             | No. of Observations | Mean | Standard Deviation | Minimum | Maximum |
|----------------------|---------------------|------|--------------------|---------|---------|
| Age_plan             | 1314                | 43.0 | 5.98               | 32      | 71      |
| Male                 | 1370                | .947 | .225               | 0       | 1       |
| Career Length before | 1265                | 13.7 | 5.62               | 0       | 37      |

<sup>37</sup> When a part-time returnee keeps their position overseas and works in China for three months a year, we used the current position.

<sup>38</sup> Many 1000 Talent awardees were working part-time or even full-time in China when they received the award.

<sup>39</sup> If they had more than 100 papers, we used the last 100. To calculate their average annual impact factor (AAIP), we used the earliest year of these records. [Not if you only took the latest 100 publications. These two sentences are contradictory.]

<sup>40</sup> First we summed all impact factors one researcher accumulated and then divided it by the length of their career (if their publication list is not up to date, the denominator will be equal to the difference between the year they receive their doctorate and the year of latest publication).

<sup>41</sup> The Talent Group of the Beijing CCP Organization Department uses more criterion to evaluate returnees, including economic benefit (*jingji xiaoyi*). But after a presentation by Zweig in October 2015, they felt that the AAIP seemed to reflect the real situation.

|                                   |      |      |      |     |       |
|-----------------------------------|------|------|------|-----|-------|
| Plan                              |      |      |      |     |       |
| Part Time Returnees               | 1386 | .474 | .500 | 0   | 1     |
| Annual cumulated<br>impact factor | 1209 | 14.9 | 25.0 | .15 | 168.1 |
| Number of papers                  | 1219 | 48.6 | 67.3 | 1   | 100   |

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### Overseas Scholar Dataset

To test the hypothesis that the part-time people are better than the people not participating in national programs, we collected the CVs of the very best Mainland scholars teaching abroad. If the AAIF of the latter group’s publications was not stronger than part-time participants, we could argue that the “best are yet to come.” We used a stratified quota sampling to find our comparative case. Based on the QS world universities ranking, we selected the top 50 U.S. universities, the top 10 UK universities, the top five Canadian universities and the top three Australian universities. Then using a random numbers table, we selected 18 U.S, four UK, three Canadian and two Australian universities. Within these 27 schools, we searched for all Mainland scholars in the sciences, engineering and medical schools. Our definition of Mainland scholars was based on whether they had an undergraduate degree from a Mainland university. In total, we found 1,010 Mainland scientists, of whom 596 are senior\_faculty, who are likely to be the target of China’s national programs (table 5). From these 596 scholars, we randomly selected 121 scholars and collected their background information (education, career information and publications) and information on their connections with China (talks in China; joint positions and co-authorship).

*Table 5. Background Information on Overseas Scholars*

| Variable                | Obs | Mean | Std,Dev | Min | Max  |
|-------------------------|-----|------|---------|-----|------|
| Sex                     | 121 | .207 | .407    | 0   | 1    |
| Age                     | 93  | 45.0 | 5.7     | 32  | 57   |
| Work_exp*               | 93  | 12.6 | 5.2     | 6   | 31   |
| Annual No.<br>of papers | 93  | 4.5  | 4.4     | .75 | 34.3 |
| AAIP                    | 107 | 17.3 | 15.9    | .66 | 87.9 |

Note: Work experience is calculated as years working after received PhD degree till 2014.

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### Comparing Full time, Part time and Non-Returnees

The data suggest that while there is a very big difference in terms of their AAIF among full time returnees (FTR) and the other two categories, there is no statistically significant difference between Mainland academics at the top universities around the world who do not list membership in any of the three national programs and those participating in these programs part time. This lack of difference is particularly true for Life Sciences and the Sciences, but a significant difference appears to exist among engineers. The good news, however, is that although the best are not returning full time, the people who spend several months a year in the Mainland are very high quality researchers who are almost equal to the best Mainland academics overseas.

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Table 6. Comparing the Impact Factor of full time, part time and non-returnees

| Variables                           | Obs | Mean  | Std.dev | Min  | Max    |
|-------------------------------------|-----|-------|---------|------|--------|
| <b>Science</b>                      |     |       |         |      |        |
| Full time                           | 370 | 8.40  | 16.65   | 0    | 178.83 |
| Part time                           | 298 | 20.56 | 27.96   | 1.31 | 163.99 |
| Non-returnee                        | 24  | 22.42 | 29.96   | 2.43 | 150.11 |
| <b>Engineering</b>                  |     |       |         |      |        |
| Full time                           | 175 | 5.42  | 8.49    | 0    | 65.15  |
| Part time                           | 177 | 10.15 | 13.85   | 0.85 | 95.21  |
| Non-returnee                        | 51  | 13.87 | 16.22   | 1.98 | 89.11  |
| <b>Life Sciences/Medical school</b> |     |       |         |      |        |

|              |     |       |       |      |        |
|--------------|-----|-------|-------|------|--------|
| Full time    | 145 | 12.00 | 18.34 | 0    | 168.16 |
| Part time    | 117 | 31.18 | 34.08 | 2.17 | 161.08 |
| Non-returnee | 33  | 33.70 | 33.84 | 3.56 | 158.30 |

\*\*\*\*\*

### Comparison among programs

Table 7 presents our findings on the quality of people under the different programs. Using the CAS 100 Scholars program as our baseline, we find (column 1) that the quality of publications of the participants in the two other programs -- the 1000 Talent and Changjiang Scholars Program -- is significantly higher than the participants from CAS.

In column 2, we control for the influence of the year in which they returned, as the quality of the returnees may be increasing, and, since some of the 100 Scholar awardees came back as early as 1995 when the program was first launched, we need to mitigate that effect. Similarly the Changjiang Scholars Program was launched in 1998, three years after the 100 Talents Plan but 10 years before the 1000 Talents Plan. Statistical results, however, show that although the quality of returnees in the national programs has been improving, the Changjiang Scholars and 1000 Talent awardees are still much better than returnees to CAS, regardless of when people returned.

Column 3 shows that full-time returnees under both the Changjiang and Thousand Talent Plan are better than returnees to CAS in the number of scholarly papers, while in both model, the Thousand Talents are only marginal significant at 0.1 level due to moderate coefficients.

The reason is that many 1000 Talent Plan recruits are engineers who enter the laboratories of SOEs or foreign firms which want them to accumulate patents much more than journal articles. Thus full-time 1000 Talent returnees are only slightly better than CAS returnees and the findings are significant at only the 0.1 level.

Table 7. Comparing the quality of national talent programs

| Dependent             | (1)                  | (2)                  | (3)                   | (4)                   |
|-----------------------|----------------------|----------------------|-----------------------|-----------------------|
| Variables             | AAIF (log)           | AAIF (log)           | AAIF (log)            | NP (log)              |
| Sample                | All*                 | All                  | Full Time<br>Returnee | Full Time<br>Returnee |
| Sex                   | 0.178<br>(0.195)     | 0.196<br>(0.194)     | 0.251<br>(0.261)      | -0.0023<br>(0.043)    |
| year_return           |                      | 0.043***<br>(0.097)  | 0.058***<br>(0.0112)  | 0.005***<br>(0.002)   |
| Changjiang<br>Scholar | 0.740***<br>(0.163)  | 0.921***<br>(0.173)  | 0.865***<br>(0.203)   | 0.097***<br>(0.032)   |
| 1000 Talents          | 1.32***<br>(0.143)   | 1.079***<br>(0.143)  | 0.371*<br>(0.201)     | 0.048<br>(0.029)      |
| age plan              | -0.031***<br>(0.001) | -0.027***<br>(0.010) | -0.028**<br>(0.013)   | -0.005**<br>(0.002)   |
| Fields of<br>Research | Controlled           | Controlled           | Controlled            | Controlled            |
| Constant              | 1.836***<br>(0.409)  | -84.92***<br>(19.45) | -114.1***<br>(22.59)  | -9.471***<br>(3.009)  |

|              |       |       |       |       |
|--------------|-------|-------|-------|-------|
| Observations | 1,204 | 1,204 | 637   | 575   |
| R-squared    | 0.153 | 0.167 | 0.152 | 0.045 |

Notes: Robust standard errors are in parentheses. The baseline group for talent programs is the 100 Talents Plan.

\*All includes both full-time and part-time returnees. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

\*\*\*\*\*

In defense of CAS, one significant difference between CAS's 100 Talents Plan and the other two programs is that the vast majority of people who join CAS' program do so on a fulltime basis.

The widespread criticism of the Changjiang Scholar and 1000 Talent Plan because of the concessions they made to the program by allowing people to join part-time reminds us that it may be unfair to compare the participants in the 100 Scholars with the other two programs because the 100 Scholars seeks only full-time returnees, rather than accepting people who remain abroad and work in China only part-time in their program. In fact, in the Changjiang and 1000 Talents plans, close to half the awardees are part-time.

- Thus in column (3) we control the type of returnee plan as well. The result supports that part time returnee performance much better than full time returnees. It is unsurprising because the opportunity cost for better scholars should be higher than their counter parts. For example, Shi Yigong was reported to leave Princeton with his annual salary up 300 thousand US Dollars and 200 million annual budgets (NY Times, 2010). The result stands after the control of types of returnee, and confirmed again that the Chang Jiang Scholar out-performs Hundred Scholars despite that it offer no more money than the later one. As a robustness check, we followed (Xie and Shauman, 1998) use the number of annual publications as a proxy for academic

performance in the regression. And the result is consistent.

As mentioned above, Hypotheses 2 is that the part-time people are better than full-time people. Intellectually we believe this may be true because part-time people may be better able to maintain their research networks and access to international information, and they may more readily avoid the interpersonal conflicts that plague Chinese institutions.

So, to test this hypothesis, we limit our analysis to Changjiang Scholars and 1000 Talent Plan awardees. In this case, our baseline model is the Changjiang full-time participants. The regression results show that there is no statistically significant difference between Full-time Changjiang Scholars and Full-time 1000 Talent returnees, nor is there a difference between Full-time and Part-time Changjiang awardees. The key difference is between the Part-time 1000 Talent awardees and the other three groups, which means that the part-time 1000 Talents awardees are better than the Full-time 1000 Talent scholars. Thus, we can confirm Hypothesis 2. Once again the AAIF is a much better measure than the number of papers.

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Table 7. Comparing Changjiang Scholars with 1000 Talent Plan Awardees

| Independent Variables | Annual Impact Factor (Log) |        | No. of papers (Log) |        |
|-----------------------|----------------------------|--------|---------------------|--------|
|                       | (1)                        |        | (2)                 |        |
| Male                  | -.001                      | (.166) | .073                | (.370) |
| Return year           | .016                       | (.012) | .001                | (.003) |
| Changjiang Part-time  | .430                       | (.392) | .060                | (.093) |
| 1000 Talent Full Time | .166                       | (.148) | -.008               | (.024) |
| 1000 Talent Part-time | .789***                    | (.093) | .057*               | (.025) |
| Age_return            | -.121*                     | (.061) | -.004               | (.002) |
| Fields of Research    | Controlled                 |        | Controlled          |        |
| Cons                  | -29.9 (23.7)               |        | -.845 (5.29)        |        |

Note: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ ; Baseline group is Changjiang Scholar Full time.

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Many overseas Chinese scholars who are involved in circular migration admitted that the research environment is their main concern, if not the last hurdle. A journalist ask Qiu Chengtong, a well-known Chinese mathematician in Harvard University, whether he has prepared to returnee permanently when noticing Qiu has move all his book collections to his house in China. Qiu answered “it depends on the research environment”. People in charge of research institutes are also clear about the problem. President of Wuhan University agree as well that the research environment is preventing part time people from returning permanently (Zhongguo Kexuebao, 2012).

### Gap between Talent Policy and Demand of Returnee

Most of, if not all, Chinese talent programs emphasize material incentives, such as salary and research funding, which are thought to be most appealing to overseas talent (Normile, 2000; Schiermeier, 2014). Clearly salary is important,<sup>42</sup> but officials also know that social benefits, such as housing, children’s education, and jobs for spouses, as well as academic rank, could be deciding factors as well.<sup>43</sup> Moreover, the gap between overseas and domestic salaries, which has narrowed in the past two decades, is less a problem today (China Daily, 2013), and certainly less important than in the early 90s (Deng, 1992).

However, officials may have overestimated the role of direct materials. As early as 2002, mainland expatriates expressed a preference for a “systematic reform of China’s environment on human talent” (*xitong gaishan guonei rencai huanjing*) over “preferential policies (Zweig and Wang, 2013), while a 2004 web survey of 3,000 respondents found that strongest force stopping people from returning was “the complicated nature of human relations in Chinese society” (renji guanxi tai fuza)<sup>44</sup> Thus while the research climate include issues such as out-dated academic standards, poorly-trained scientific workers, a lack of cutting-edge information, finding talented

<sup>42</sup> Herbert Brücker, Simone Bertoli, Giovanni Facchini, Anna Maria Mayda, and Giovanni Peri , “The Determinants of Highly Skilled Migration: Evidence from OECD Countries 1980–2005,” in Herbert Brücker, et. al. (eds), *Brain Drain and Brain Gain: The Global Competition to Attract High-Skilled Migrants* (Oxford University Press, 2012).

<sup>43</sup> Zweig and Chen, 1994. Scholars of international migration also emphasize factors other than money that prevent reverse migration such as family ties, cultural adaptation, children’s education and career (Vadean and Piracha, 2009; Carling and Petterson, 2014).

<sup>44</sup> Source: Finn (2014) Stay Rates of Foreign Doctorate Recipients from U.S. Universities <https://orise.orau.gov/files/sep/stay-rates-foreign-doctorate-recipients-2011.pdf>.

collaborators and a vibrant academic community, as well as the lack of international recognition (NY times, 2011; Shi and Rao, 2012), managing “guanxi” or relationships, is the most popular reason. These academic networks in China place newly returned scholars at a disadvantage compared to locals or earlier returnees, limiting their access to research funding (Benderly, 2013). According to one CAS researcher who was a 1000 Talent Awardee,

*Recent returnees will always have more trouble getting grants. It takes at least three years for people to know and trust you. There are two aspects to evaluating an application. First, the project plan, with 60-70% of the evaluation based on that. . . . But 30-40% of the evaluation is based on relationships, it can't be avoided in Chinese society especially since everyone can guess who wrote the application. Also, although much of the money goes directly to the applicants, the directors of research institutes can decide who can apply for the grants.<sup>45</sup>*

Finding collaborators is also difficult when young returnees have to wait for their department to assign them doctoral students with whom they can work.<sup>46</sup> (Benderly, 2013; Xinhuanet, 2012).

A survey done in 2011 for the Central Organization Department of the CCP (zuzhibu) on high-end scientific returnees under the 1000 Talent Plan confirmed the gap between the policy emphasis of the state programs and the concerns of overseas Chinese scientists (Table 3). When scientists mentioned “having to have dinners with directors in charge of research funds”<sup>47</sup> or “trying to create relationships,” they are not only referring to troublesome cultural phenomena but rather to an institutionalized and powerful scientific elite with whom they must build connections. To the extent that the scientific and academic elites holding powerful administrative position and controlling personnel allocations and research funding are locally trained scientists or administrators with limited overseas experience (Guo, 2012; Chinanews, 2006), a strong conservative camp may resist reform of the scientific environment. Thus according to Shi and Rao, China’ research culture gives too much advantages, to established researchers and those with close ties to government officials, which increases research-funding inequality and concentration (Shi and Rao, 2010). Similarly, Cao et. al. argue that “a substantial portion of public funding at almost every ministry is funneled to favorable scientists, often well-established through earmarks

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<sup>45</sup> Interview in Guangzhou, November 2011.

<sup>46</sup> This situation was confirm by authors as well when interviewing a young 1000 Talent returnee in Beihang University. They cannot recruit student as they want, but rather they have to wait for the department to assign student to them.

<sup>47</sup> source

of applications received in formally, rather than through rigorous and fair peer reviews.”<sup>48</sup>

Thus, state policy may not be as effective in bringing about a reverse flow of the best talent because policies fail to respond to the priori needs of overseas returnees. As long-term career concerns are the top priority of many potential returnees (Benderly, 2013; Organization Dept, 2010; Iredale and Guo, 2001; Wadhwa, 2009; Wang, 2010; Zweig, 1997), one big research grant is less a guarantee of future opportunities than an appropriate environment for career development (Cao, 2008). Bai Chunli, the President of CAS, realized the importance of career and the research environment, (Bai, 2011; Miao, 2010:442-443), but resistance to reforming the research environment and the key to reform is also in research institutes (Jingji Ribao, 2012; Rao, 2012).

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Table Three. Discrepancies between provision of national talent programs and demand of returnee

| <b>Government Policy<br/>Priorities*</b>   | <b>Survey by Organization<br/>Department, 2011**</b>   | <b>Critiques by Scholars***</b>   |
|--|--|---|
| Salaries competitive with those overseas   | Research Culture is a major problem  | Personal relationships too complex  |
| One package of research money (Lots of research money which is relatively easy to get) | Research funding based on “guanxi” not quality, while Returnees must share awards with locals in the same unit | Research Culture dominated by administrators with “bias” against returnees  |
| Visa or residence permits decrease “transaction costs”                                 | Administrative intervention is common; may determine who can apply for grants.                                 | Too much academic misconduct and falsification hurts returnees’ reputations |
| Living Conditions (size of apartment, children’s education, spouse’s work)             | Research Project application too complex   | Too much money allocated through the bureaucracy rather than through        |

Note:\* Policy statements for Cheung Kong Scholar Plan and Thousand Talent Plan.

\*\* Organization Department, 2011 Thousand Talent Implementation Survey

\*\*\* Rao Yi and Shi Yigong, *Science*; Cao (2008) “Why Government Policy have Failed to Attract First-rate Returnees” and presentation by Zweig to Minister Li Yuanchao, Shenzhen, 2012.

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### **The problem of local resistance**

The remove of these handicaps will definitely encourage overseas Chinese scientists work in China. However, policy intended to create an inclusive institutional environment may also suffer from the strong resistance from local entrepreneurs/academic communities who have been enjoying the rent (Cao, 2008). The resistance to scientific reform could be multi-sources, down from university presidents and state organizations in charge of research funding to grass-root lecturers. Grants are allocated by administrators who lack expertise in evaluating proposals, rather than by open, competitive peer review. Staffs are not encouraged to be skeptical about existing theories, especially those held by senior staffs who control resources (The Economist, 2014). The evaluation and promotion also have problems: the result is management by numbers: academics are rewarded for the quantity of their publications instead of quality. Earlier returnees who assume power eventually could also be the source of resistance. Most of them are visiting scholars and post-docs back in the 80s and earlier 90s, and cannot compete with peers who stay aboard since then and consider returning now. Local PhDs who cannot compete with overseas returnees could resist the reform fiercely.

The incident of Shi Yigong and Rao Yi in applying for CAS fellowship at 2011 is another example of popular resistance to returnees. As the former chair professor in Princeton University and Northwestern University, Shi and Rao, respectively, have gain world-wide recognition in academic achievement, but they still find it is hard to compete for research money in China (Shi and Rao, 2010). One way to get advance in competing with other applicant for research funding is to get the fellowship in CAS. As Wang Xiaodong, a fellow of National Academic of Science, biological branch, stated “Rao’s academic achievement is far beyond all candidate in that round, and even more than many of CAS fellows”. However, none of them is able to manage into the second round selection. Ironically, Shi Yigong was elected the Foreign Associate of the US National Academy of Sciences in 2013. In 2012 China Youth Daily interview a handful CAS

fellows trying to unveil the reason why Shi and Rao failed in the election of previous years. However, except casting doubt on Shi and Rao's nationality, which is then denied by secretary of CAS executive committee, none of interviewees is able to give an answer to the result. Agreed by Rao and others, the electoral procedure of CAS fellowship "could be the most transparent and democratic in China's affairs" (China Youth Daily, 2012), the result definitely represents the "opinion of the majority".

The top-down approach may also encounter setbacks. Former minister of MOST Xu Guanhua tried to reform the scientific award system. However, only two participants in the round table discussion support to take a reform, as revealed by a research fellow from CAS (Sciencenet, 2011). The reform never came into being even after Xu left MOST.

The resistance was further confirmed by author's in-depth interview and field observation<sup>49</sup>. The source of resistance to the 1000 Talents plan became clear to the author in June 2012. At a meeting in Shenzhen of about 60 people with then Director of the Organization Department, Li Yuanchao, who was the leader responsible for the program, the president of Dalian Polytechnic University, which is funded under the '985 world-class university program,' who had been a Visiting Scholar at Columbia University many years before, criticized the program's large salaries, bonuses, and, what he saw as unfair "preferential policies" given to these high flying returnees which he said harmed the enthusiasm of locally trained scholars. He, and the director of a CAS institute in Beijing sitting beside him at the meeting, who had also been a Visiting Scholar overseas, preferred more equality and less income and status differentiation. No doubt, they also liked the fact that most research money flowed through their hands, rather than through competitive grants under the Natural Science Foundation of China, helping them build their own network. Yet when pressed, the university president admitted that one-third of his faculty had been trained at his own university, one third had degrees from other universities in China, and one-third were returnees. In the face of a direct challenge by a Politburo member, he promised to stop hiring faculty trained at his own university. Li took great exception to their views, declaring that the goal of the policy was to promote "development" not "equality," and by the end of the summer, the president of this university was out of a job (Zweig, 2015).

Even high-end returnees who are granted considerable power in existing institutes still face strong resistance from the local academic community. One prominent case is from Zhejiang University, one of the top 5 universities in China. Guan Minxin, a former professor in University of Cincinnati, returned to Zhejiang University serving as the dean of the school of life science.

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<sup>49</sup> David Zweig was sitting in the meeting with Li Yuanchao and universities presidents on national talent policies and returnee.

Guan signed a three year contract with university and was expected to conduct some reforms in life science school. However, he was forced to step down from the dean of School before finished his contract– the other two senior vice deans of the life science school who strongly oppose Guan’s reform policy refused to give up their power, and conduct a coup (China Youth Daily, 2013 Dec 6). The university tried to persuade another overseas returnee Dean of graduate school, Dr. Feng, to takeover Guan’s position as dean of school, but Feng refused. He then explained to China Youth Daily, “Guan has made some achievements, but he has a hard time on managing the relationship with colleagues...in an environment full of ‘old comrades’”. Feng is able to survive because He “was in a different environment... it is a ‘Special Academic Zones’, where the director (Feng) have full autonomy in recruitment.” (China Youth Daily, 2013 Dec 6)

The reform of Peking University (hereafter Beida) is a typical case for the resistance in school and grass-root level. In 1994, Beida established the Chinese Center for Economic Research (CCER) as a tryout for “small environment”. After the talk of President Jiang in 1998, the reform was extended to Guanghua Business School (GHBS) under the lead of a Returnee, Zhang Weiyong from Oxford. In 2003, to response to the call of “university reform and talent work” from MoE, Beida delegated Zhang to conduct personnel reform in the university level. However, the reform received strong protest from faculties, and was eventually stopped. The entrenched interests in institutional settings that fear the new norms is an important resource of resistance (Zweig and Yang, 2014).

### Efforts to Demolish Resistance

The above discussion implies that a fundamental problem stopping overseas Chinese scientists from returning is the strong conservative forces resisting reform, who also account for complex *guanxi* and out-dated research regulations. Central government is aware of the importance of “building good research environment” in bringing talents back (Chen, 2001; MoE, 2004) Since the key to change research environment is at the hand of leaders of institutes, who have the dual role of state agent and institute principal, strong political force from the central government would be an ice-breaker. From Jiang Zemin to Li Yuanchao, political leaders have make big effort to push forward scientific institutional reforms. They set up political organizations which unite fragmented bureaucracies, e.g. Central Coordination Group of Talent (CCGT), design policy targets, and push the target through party system (Zweig and Wang, 2013). Local government and research institutes are enthusiastic on recruiting overseas talents through the national programs because except for the signaling effect of embracing central

government, they could gain substantial money from the state departments (Zhao and Zhu, 2009).

Because of its dual importance in both research capacity and talent work, the returnee recruitment comes to the top of university presidents' task along with the mobilization. Universities become a proactive agent in the overseas talent market (Li, 2009). There are several easy strategies: overseas recruitment, reform local institutions and extra-benefit provision. First, universities sent out talent recruitment teams overseas to lobby Chinese professors in world famous universities, and try to persuade them to work for/with Chinese universities (Zweig and Wang, 2013; Wenxue Cheng, 2002). Some universities even built up their own "overseas talents database" for the convenience of the further recruitment practice (Fudan University, 2008).

Besides these easy strategies, a powerful but costly choice is to change the research environment. Although leaders of research institutes have no interest to reform existing academic institutions and train skillful scientists, research institutes have to take certain degree of reform, like loosen control over personnel and research, so as to compete for the best talent, as put by Duan Qingyun, a 1000 talent returnee (Xinhuanet, 2012) Since the reform usually put leaders of institutes under the gun point of conservative group, the reform tends to be in a small scale, for example, establishing an special academic zone (SAZ), or reforming a school under the instruction of an Overseas Dean.

One fantastic feature of SAZ is that, institutes can apply western academic criterion with lower resistance from senior faculty than in existing schools because of independent audit and ranks.<sup>50</sup> The tenure track system is widely adopted in SAZ – there is no university-level tenure system reform was successfully launched in China. Besides, returnees also favor the horizontal organization in SAZ, which leaves them more autonomy in doing research and recruitment. Principle investigators in Institute of Advanced Studies (IAS) of Xi'an Jiaotong University could focus intensively on research, with little interruption from administrative work (China Education Daily, 2013). A number of universities have built similar IAS inside the university, for example, Tsinghua University, Fudan University, Wuhan University, Shanghai University of Finance and Economics (SHUFE), etc.

Another option is to reform existing school with the effort of Overseas Dean. An Overseas Dean could keep his full time job overseas while work part time, e.g. three months, for domestic institutes. The requirement allows research institute to hire better talents from overseas because it does not require a permanent return. Overseas deans are good for the internationalization of domestic research institutes, establishing the overseas connection and collaboration between institutes. Also with the aim to improve the research capacity, overseas deans usually conduct

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<sup>50</sup> Author's interview in Beihang University.

institutional reforms like tenure track and western academic evaluation systems so as to attract more overseas graduates. The most successful example is SHUFE, which has 8 overseas deans and rising fast in the university ranking. Other universities that hired at least one overseas dean includes Southwest Jiaotong University, Nankai University, etc. However, overseas dean is more risky than SAZ given the strong local resistance.

## The Role of Returnee Presidents

### **1. The decline of conservative power helps to bring returnees back. (institutional explanation)**

Hypothesis two is the counter argument to hypothesis one. It assumes that the local resistance to reform existing research environment is the key obstacle to the return of high quality returnees. Thus it argues that in places where local resistance is lower the quality of returnee will be higher, and the number of national talent program participants will be more<sup>51</sup>.

#### Problem of local resistance – difference between CAS and universities

Though above analysis does not rule out the effect of material compensation on bringing back returnees, it shows that money has its limits when dealing with intellectuals. Money can have an impact, but if China wants to “bring back the best” (Cao, 2008; Zweig and Wang, 2013), then it need to understand the factors resisting the continuing improvement of quality of returnee.

Among the three national talent programs, the Hundred Scholar Plan is administrated by Chinese Academic of Science, which means all Hundred Scholar Recipients work in CAS. On the other hand, launched by MoE and Organization Department respectively, the Chang Jiang Scholar Plan and 1000 Talent Plan are targeting at people who return and work in universities and research institutions, including CAS. Thus, it is reasonable to suspect that the discrepancies in the quality of returnees are endogenous to working environment after return. So we take the destination in CAS as one variable in the regression analysis<sup>52</sup>.

The result in Table 8 column (1) shows that comparing to all returnees from three national talent programs, the academic performance of returnees to CAS was significantly lower than those not, i.e. universities, and after controlling for the effect of the talent programs. Then in column (3), to further rule out the possible confounding impact from the Hundred Scholars Plan, which may have lower quality due to reasons related to the program, we run the regression using returnees only from Chang Jiang Scholar and 1000 Talent Plans<sup>53</sup>. The result is consistent with the previous result: returnees who went to universities as their first stop after returning are relatively more competitive than those who first went to CAS.

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<sup>51</sup> We assume that the competition for national talent program is fair and all depends on their academic performance. There are several supports. The national talent selection process is strictly conducted by overseas academic committee, who are not under the control of any Chinese academic institutions.

<sup>52</sup> Only people who took CAS as the first work place after return are counted as *Returnee to CAS*, because otherwise they are not “attracted” by CAS but rather by Universities.

<sup>53</sup> Because Changjiang Scholar is sponsored by MoE and targeting at universities, no Changjiang Scholar returnees went to CAS as the first top.

Table 8. CAS versus Universities in the quality of returnees.

| Sample Group            | All 100 Scholar Programs | Without 100 Scholar pre-2008 | CJ Scholar and 1000 Talents** |
|-------------------------|--------------------------|------------------------------|-------------------------------|
|                         | (1)                      | (2)                          | (3)                           |
| Returnee to CAS         | -.100*** (.021)          | -.109*** (.024)              | -.108** (.029)                |
| Male                    | .212** (.057)            | .102 (.133)                  | -.004 (.173)                  |
| Year of Return          | .022** (.009)            | -.019 (.013)                 | .016 (.012)                   |
| Part Time               | .588** (.141)            | .571** (.142)                | .567** (.141)                 |
| Age when return         | -.035** (.010)           | -.036** (.011)               | -.032* (.013)                 |
| National Talent Program | controlled               | controlled                   | controlled                    |
| _cons                   | -42.1* (19.1)            | -34.4 (25.7)                 | -28.9 (24.9)                  |
| Subjects                | Controlled               | Controlled                   | Controlled                    |
| Obs                     | 1070                     | 851                          | 760                           |

Note: \*p<0.1 \*\* p<0.05 \*\*\*p<0.01

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Given CAS' leading role in Chinese scientific community the results are surprising. Established in 1955, CAS is the highest ranked academic institute in China. Ranking 6<sup>th</sup> in the Nature Publishing Index<sup>54</sup> 2013 and the 1<sup>st</sup> in Asia, CAS is still among the best research institutes in China today, though some universities are catching up (Nature Publishing Index, 2014). With the largest national research funding, the most advanced laboratories, well trained researchers who could collaborate with returnees, and the best reputation in scientific studies, CAS should be the ideal work place for scientific returnees. Moreover, despite no undergraduate students, CAS had many high quality graduate students since the 1980s which help CAS building a strong Diaspora network. However, our results do show that CAS is having difficulties maintaining its high standards. Contrary to expectations, many returnees who worked in CAS before going abroad chose to work in universities after returning.

<sup>54</sup> The Nature Publishing Index Asia-Pacific tracks research published in Nature journals from the Asia-Pacific region during the past 12 months (Nature Publishing Index, 2014).

According to Cao (Nature, 2014), universities and individual research institutes, which are increasingly competing with the CAS for leading scientists, offer a better management environment for scientists, which leading him to assert that “There probably is no reason for the CAS in China right now” (Nature, 2014). The source of the problem, we argue, is the formidable conservative power inside CAS which strongly resists reforming its research environment. First, the resistance in CAS can be strong because the rank of the president of CAS is equal to the minister level, such as MoE, therefore policies sponsored by the MoE have limited influence on CAS. Second, the Principle Investigator system in CAS fostered a paternalistic tradition. Existing Principle Investigators use their power and resources in selection of newly enrolled Principle Investigator, and create their own elite circle (Jin, 2011).

The research institutions of CAS do not favor high quality returnees as much as universities, though 74% of CAS researchers have overseas experience, because CAS leaders worry that the high salary and special privileges entitled to returnees will create conflict inside their institutes, as admitted by a vice-president of CAS (Shi, 2010). One Chinese university scientist claimed, “CAS hires too many young scientists who then go through little or no review, and essentially receive tenure without having to prove themselves” (Cyranoski, 2014). None of the newly established five CAS research institutes in 2010 hired a director from overseas. When questioned about this, vice president of CAS, Shi Erwei, said that they want to manage the institute in ways that are different from those recommended by returnees who tend to prefer western norms (Shi, 2010).

Another problem is that earlier returnees who came to power and took up most of key positions in CAS when they were relative young, are not willing to step down in favor of younger talent who are coming in from abroad. As a pioneer in national talent policies, CAS has a large number of returnees from the 90s or even the late 1980s. These earlier returnees rose to power quickly since they were academic elites in China at that time. Not only they hold too many the leading positions in the each field, but they have the authority to determine the research direction of each CAS institute, so that there is relatively less room for new research teams when compared to universities (Wang, 2012; Wang, 2011).

Further, CAS restructured its research institutions in late 1990s. Then each branch of CAS became a loose collection of research groups, among which there was little connection (Ding, 2012). Thus, the power of president is not comparable to the university president, who has the authority to create special academic zones or give extra privilege to returnees. Meanwhile, research groups in CAS relied heavily on financial allocation from the central government. Less than half of CAS money is from competitive research funding (Bai, 2015). Thus the internal struggle over this large amount of allocated funding is likely to be intense. On the other hand, for

external money, as admitted by Bai Chunli, president of CAS, the fact that scholars are evaluated by money they raised exacerbates the research funding allocation problem – researchers have to focus on getting money rather than making best use of the money they received (Bai, 2015). One of the rare part time overseas dean in CAS, the head of institute of neuroscience, Poo Mu-ming, once told a story that inside the institute. People there have to pay most of attention on raising money even he got no idea how to use it, because otherwise he will be seen as a loser. (People’s Daily, 2010).

Presidents can demolish local resistance – differences among universities

Compared to universities, CAS has a strong conservative group that resists further institutional reform though, there are other reasons for the catching up of universities bring in better people: the “985 project” pours considerable amounts of money into universities, 20% of which is earmarked overseas returnees (Wang, 2012; Zweig et al, 2008). To further consolidate our argument that universities are more like to break the local resistance, we explore the difference among universities in the effort of bringing back high-end returnees through national programs. we construct a panel data set that consists of variables on number of high-end returnees in that year, the president’s age, overseas experience of the president, being promoted internally through their host university or not, and other control variables. The data used in this study cover 27 universities and 61 university presidents from the year 1999 to 2012<sup>55</sup> (Appendix V).

According to our hypothesis two, universities in the year that have more open research environment and lower level local resistance would have more number of returnees. Since the research environment cannot be directly measured, we use two variables as proxy for the willingness to challenge local resistance and reform research environment: whether the president holds a overseas Doctor degree, and whether the president are promoted from external. Positive answers to both questions are taken as the willingness for reform.

Table 9. Regression on University President and number of high-end Returnee

| Independent Variables   | Baseline Model    | Internal Promotion | Robustness - Age | Visiting Scholar as Baseline | Visiting Scholar Robustness |
|-------------------------|-------------------|--------------------|------------------|------------------------------|-----------------------------|
|                         | (1)               | (2)                | (3)              | (4)                          | (5)                         |
| <b>Overseas_PhD</b>     | 1.95***<br>(.694) | 1.52**<br>(.667)   | 1.46**<br>(.689) | 1.43** (.670)                | 1.47**<br>(.687)            |
| <b>Visiting_Scholar</b> | 1.25<br>(.787)    | .916<br>(.627)     | .815 (.691)      |                              |                             |

<sup>55</sup> These 27 universities are all under the supervision of MoE. There are in total 75 university under direct control of MoE. Some of them are highly discipline-oriented, so the number of returnee is very small in these universities. Introduction to the University President and returnee data please find Appendix V

|                            |     |                |                |               |               |
|----------------------------|-----|----------------|----------------|---------------|---------------|
| Age                        |     |                | .027 (.380)    |               | -.364 (.500)  |
| Age_2                      |     |                | -.001 (.003)   |               | .003 (.005)   |
| <b>Promoted Internally</b> |     | -1.15** (.443) | -1.14** (.431) | -.946* (.546) | -.981* (.528) |
| University Fixed Effect    | Yes | Yes            | Yes            | Yes           | Yes           |
| Year Fixed Effect          | Yes | Yes            | Yes            | Yes           | Yes           |
| Obs                        | 376 | 376            | 376            | 265           | 265           |

Note: the dependent variable is number of high-end returnees from the three national talent programs. Tenure means how long they have been of stayed in office.

\*\*\*\*\*

Table 9 reports the Fixed Effects Model results based on combining all the university presidents. Our results confirm Hypotheses 1. According to our Baseline Model (1), which compares those with Overseas PhDs to presidents with no overseas experience at all, we find that presidents with an Overseas PhD degree bring in 1.95 more returnees per annum, a finding which is statistically significant at the 0.01 level. This finding is also 64.1% more than the average number of returnees to these universities (table 3), which was 3.04, reflecting a large practical significance. On the other hand, if the president had only become visiting scholar, which implies less extensive intellectual transformation than getting an overseas PhD, we found no statistically significant effect on the number of returnees recruited when compared to those who have had no overseas experience. Second, we analyze Hypothesis 2, career trajectory, in our second model (2) and find that whether or not a president is internally promoted, as compared to being brought in from the outside (externally promoted), affects whether the university recruits overseas returnees from the two programs. Universities whose president was internally promoted recruited 1.15 fewer high-quality returnees than universities with externally promoted presidents. Also, in the second model, we still find that universities with a president with an Overseas PhD are 50% more likely to hire a returnee and overall hire 1.52 more returnees per annum. The reason for the decrease of the impact of the Overseas PhD degree is because presidents who are overseas PhDs are much more likely to be externally promoted.

Finally, our model presented in column 4 directly compares the difference between having an Overseas PhD and being a Visiting Scholar, dropping the cases of presidents without any overseas experience. We find that having an Overseas PhD remains statistically significant

(.05), and that this group is likely to recruit 1.43 more returnees per year than the Visiting Scholars. However, because of the decrease in the number of observations to 265, and the increase in the standard deviation, the level of significance of internal promotion drops to 0.1. Nevertheless, we can still argue that having a president with an Overseas PhD, as compared to having a president with no overseas experience or experience only as a Visiting Scholars, means that the university is more likely to recruit world class scholars from abroad.

### Reforming CAS

CAS' weaknesses did not go unnoticed by the top leadership. Soon after taking over as head of the Organization Department, Li Yuanchao proposed what he saw as model institutes which reflected Western recruitment, funding and evaluation criteria. For example, the success of the National Institute of Biological Sciences is a typical example. The features of it are summarized as follow: firstly, the financial support comes from a singular channel. In this case, the time for negotiation among different sponsors can be saved for doing research. Second, NIBS has a very strict standard of assessment. A team leader of a research project of NIBS is possible to become unemployed due to the international assessment. Third, the recruitment standard of NIBS is very high. A researcher may able to be nominated to be an academician in other institutes, but in NIBS, it is even difficult to be promoted as professors. The establishment of these new types of institutes would give scholars more chance to focus on research and challenge the limits. But much of his agenda stalled. In fact, when the then minister of the Ministry of Science and Technology, Xu Guanhua, tried to reform the scientific award system, only two participants in a round table discussion he held supported reform.<sup>56</sup>

On 17 July 2013, the new General Secretary of the CCP, Xi Jinping, visited CAS' Institute of High-Energy Physics, toured Beijing's Electron Positron Collider, met with three generations of CAS scientists, and listened to a report by CAS President, Bai Chunli.<sup>57</sup> Xi thereupon directed CAS to cultivate innovative talent, achieve a leap-forward in S&T, establish a high quality S&T think tank, and build numerous internationally leading research institutes. His directive triggered a major reform within CAS, which in the words of Bai Chunli, was "inevitable." The program, called the "Pioneer Action Plan," was one year in the making and was passed by the "Leading Group of State Scientific and Technological Reform and Innovation System Construction," as well as by Xi Jinping. Strategies under this plan include a new "100-Talent Program," which

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<sup>56</sup> (Sciencenet, 2011)

<sup>57</sup> "On CAS reform and Pioneer Action Plan—An interview with CAS President Chunli Bai," National Science Review Advance Access, published November 27, 2014.

seeks to strengthen the existing program and enhance the research and living environment for young scientists. But Bai was not specific about how long CAS could support researchers who did not engage in some degree of contract research, or what he called “task oriented research.” Noteworthy is the fact that as Bai summarized his goals, he raised the point that “CAS must produce some unique and breakthrough achievements in S&T that better justify its existence as the most prominent research institution in China.”<sup>58</sup>

The “Hundred Talents Program” of the “Pioneer Initiative,” also known as the new “100 Talents Program,” involved creating three types of returnees, Academic Leaders, Technological Excellence and Young Talents. These “Academic Leaders” must have worked as full professors or in equivalent positions in eminent universities, internationally recognized research institutions or enterprises. Funding for the posts was now set at seven million RMB, (including 3 million RMB for team building and 1 million RMB to cover infrastructure construction), far beyond the 2.2 million RMB given under the old 100 Talents Plan. In December 2015, CAS proposed 59 new specific positions as “Academic leaders,” and 84 specific jobs as “technological excellence.”<sup>59</sup>

The second category, “Technological excellence,” are young and middle aged researchers who, while working abroad, mastered some key technology, or helped construct a big-science facilities or scientific instruments. They should be capable of solving key technological problems and promoting technological innovation. Their package includes one to two million RMB and funds of 600,000 RMB for their own infrastructure construction. Finally, the “Young Talents” must have a PhD and three years research or working experience in internationally recognized universities or research institutions abroad. These “young talents” should also have already established some reputation in their research field for innovative ideas. Given the requirement that the PhD should have been conferred within five years, these researchers are in essence post-doctoral fellows. As such their first two years are largely a testing period, during which time they receive a funding package of 0.8 million RMB. After two years at CAS, they will be reviewed, and some will be selected for the “Hundred Talent Program” with a funding package of 2 million RMB and an infrastructure construction funding of 0.6 million RMB from CAS.

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<sup>58</sup> “On CAS reform and Pioneer Action Plan—An interview with CAS President Chunli Bai,” National Science Review Advance Access, published November 27, 2014.

<sup>59</sup> “Global Recruitment of Pioneer “Hundred Talents Program” of CAS,”

[http://english.cas.cn/join\\_us/jobs/201512/t20151204\\_157107.shtml](http://english.cas.cn/join_us/jobs/201512/t20151204_157107.shtml)

Finally, in the process of implementing the new Pioneer Plan, consideration was being given to adjusting the evaluation of researchers away from sole reliance on publications and funding. According to one commentator, “there is both truth and error in using academic publication as a criterion to evaluate the work of a scientists... Even though the citation of researchers’ academic papers reflects international recognition of their work, it is not necessary to be some extreme as to use this as the only criteria.”<sup>60</sup>

## **Conclusion**

### The Diaspora Option

These findings could lead one to assert that the funds used for these programs are largely wasted, as the best people do not return fulltime. No doubt, when the MOE first established the Changjiang Scholar program and when Li Yuanchao set up the Thousand Talents Program, the goal was to recruit the top talent fulltime. In both cases, officials had to make major concessions, as many participants in the programs did not want to give up their overseas posts but yet were willing to engage with China under the rubric of a more parttime basis.

Therefore, one

Long-term significance of our findings

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<sup>60</sup> “State Council offers Science, Tech Plan,” *China Daily*, 25 September 2015, accessed on 1/10/2017.

Appendix I

Table 1. List of Universities in overseas scholars pool

| <b>List of Universities in Pool</b>                           |
|---|
| <i>18 U.S. Universities represented for Top 50 in U.S.</i>    |
| Harvard University  |
| University of California, Berkeley                            |
| Princeton University  |
| University of California, Los Angeles                         |
| University of Pennsylvania                                    |
| The Johns Hopkins University                                  |
| University of Illinois at Urbana-Champaign                    |
| Northwestern University                                       |
| University of Colorado at Boulder                             |
| University of California, Santa Barbara                       |
| The University of Texas Southwestern Medical Center at Dallas |
| University of California, Davis                               |
| Pennsylvania State University - University Park               |
| Purdue University - West Lafayette                            |

|  |
|--|
| The Ohio State University - Columbus                                 |
| Boston University  |
| Indiana University Bloomington                                       |
| Baylor College of Medicine   |
|  |
| <u>4 UK Universities represented for Top 10 in UK</u>                |
| University of Oxford   |
| The Imperial College of Science, Technology and Medicine             |
| University of Bristol  |
| London School of Economics and Political Science                     |
|  |
| <u>3 Canadian Universities representing for Top 5 in Canada</u>      |
| University of Toronto  |
| University of British Columbia                                       |
| McGill University  |
|  |
| <u>2 Australian Universities representing for Top 3 in Australia</u> |
| University of Melbourne  |
| The Australian National University                                   |

Note: Blue ones are selected as sample universities.



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