

Research Productivity of Returnees from Study Abroad in
Korea, Hong Kong, and Malaysia
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Abstract

This study analyzes whether academics with advanced degrees from foreign universities are more research productive than their domestic counterparts in the three selected East Asian higher education systems – Korea, Malaysia and Hong Kong. The three systems have relatively large proportions of foreign degree holders among their professoriates. The data for this study is drawn from the Changing Academic Profession survey. In our negative binomial regression analysis, we found that foreign degree holders are not more research productive than their colleagues with domestic degrees, and even slightly less productive than their domestic degree holders in soft disciplines (social sciences, and arts and humanities) in Korea. Furthermore, foreign degree holders are much less productive in hard disciplines (natural sciences, engineering, and bio-medical sciences) in Malaysia. Finally, we discuss the findings and attributes them to contextual differences between the three localities.

Keywords: study abroad, research productivity, returnees, Korea, Malaysia, Hong Kong

Introduction

Having an advanced degree from a foreign country with an academically competitive university system is highly regarded for academic employment in higher education systems of East Asia.¹ Such foreign degrees are usually viewed as a sign of a high quality education and advanced level research skills. Employers tend to perceive foreign degree holders as well trained and more research productive. This is the case in many East Asian higher education systems, except Japan with its already well-established domestic knowledge hub noted by Cummings (1994). In most East Asian countries, a significant portion of academics hold a Ph.D. from the U.S., the U.K., or other advanced Western countries. The preference to hire foreign degree holders is also viewed as a way to heighten university competitiveness since the global rankings emerged in the 2000s. In the wake of the global rankings, several East Asian countries have responded with world-class university initiatives. These initiatives emphasize the importance of international journal publications and encourage institutional leaders to hire more foreign degree holders. However, the belief that foreign degree holders are more research productive in these countries is rarely tested with empirical data.

The pattern of hiring foreign degree holders differs from country to country. For example, a country with a well established research system (e.g., Japan) favors domestic degree holders, especially in social sciences and humanities (e.g. Horta et al. 2011). On the other hand, recently established research systems or rapidly growing systems – for example, Korea, China, including Hong Kong, Taiwan, Malaysia, and Singapore – place a high priority on hiring foreign degree holders (Shin and Kehm 2013). In addition, faculty hiring patterns in the higher education systems of Korea, the Chinese mainland, and Taiwan differ from those in Singapore and Hong Kong. Both Hong Kong and Singapore are more successful in hiring internationally mobile academics because they have highly developed research capacities and use English as the major language for teaching, research and academic communication as discussed by Postiglione and Jung (2013) and Ho (2013). On the other hand, Korea, the Chinese mainland, and Taiwan tend to look highly upon their native academics who studied abroad (e.g. Finn 2007). Compared with newly established research systems of Korea and Hong Kong, Malaysia has relatively less research capacity and support, as well as modest academic salaries. Malaysia also hires a large share of returnees from

¹ As used here, East Asia includes both southeast and northeast Asia.

abroad through a policy initiative which requires recipients of scholarships to sign a contract with the government to return and work for the country upon completion of their PhD programs.

In these Asian contexts, the question arises whether or not foreign degree holders are more research productive than domestic degree holders, and whether there are systematic differences in research productivity between domestic and foreign degree holders across higher education systems. Therefore, this study analyzes and tests whether foreign degree holders are more research productive than their domestic counterparts in the selected East Asian higher education systems. We selected Korea which hires foreign degree holders in its newly established research system, Hong Kong, a Special Administrative Region of the PRC that with a majority of academics who possess foreign degrees, and Malaysia which hires an increasing number of foreign degree holders in its emerging research system. The two research questions are: Does the research productivity of those with a foreign Ph.D. differ from those with a domestic Ph.D.? If so, what is the pattern as it applies to that research productivity across academic disciplines and higher education systems?

Background

Study Abroad in Different Contexts

Theoretical perspectives help explain several dimensions of study abroad in different contexts. One group of studies focuses on factors that push or pull students to study abroad. According to these studies, push and pull factors are related to political, economic, and social structures in both the home and host countries (e.g. Bratsberg 1995; Cantwell et al. 2009). Another group of studies highlights the gains and losses to human resources and adopts the concepts of brain gain and brain drain, including how to minimize brain loss in the developing countries (e.g. Carrington and Detragiache 1998). The academic discourse on brain drain and brain gain has evolved to include 'brain circulation' to explain returning foreign degree holders or countries that attract highly qualified mobile scholars (e.g. Le 2008; Lee and Kim 2010; Saxenian 2002). Other studies, especially those by sociologists, have highlighted theoretical dimensions such as the dependency relationships between sending and receiving countries, and some sociological discussions about social class conflicts (Altbach 1981; Aronove 1980; Brown 2000; Hirsch 1976).

Singular perspectives have been unable to fully explain the multidimensional features of study abroad and student mobility, as Kim (2011) In addition, the brain drain perspective and the academic dependency perspective are more powerful frameworks for explaining study abroad in many African and Latin American countries than for East Asian localities such as Korea, Mainland China, Taiwan, and Hong Kong. In particular, Korean students' return rate after an advanced degree is higher than other countries. For Korea, the positional competition perspective makes more sense for explaining study abroad in these countries (e.g. Kim 2011; Waters 2009). Considering the differences across the countries, Bennion and Locke (2010) classified academics' internationality into three categories: "study abroad", "magnetic", and "self-contained." In their classification, "study abroad" implies undertaking doctoral training abroad (e.g. Korea, Mexico, Malaysia), "magnetic" refers to the attraction and flow of academics to a higher education system (e.g. Hong Kong), and "self-contained" portrays the internal movement of academic staff from study to employment within a national higher education system (e.g. Japan).

Considering different economic and academic contexts as well as study abroad practices, a comparative study can deepen our understanding of whether or not foreign degree holders are more productive within the context of each system of higher education. Korea has a relatively well established higher education system with a strong economy, which boosts the return rate of Korean nationals who studied abroad (Finn 2007). Malaysia is relatively less developed in terms of both its economy and the maturity of its higher education system. Hence, the push and pull factors result in more brain drain (The World Bank, 2007; Malaysia, 2010). Hong Kong is a case of brain gain (or brain circulation) that pulls a large number of nationals and non-nationals, the majority of both with foreign doctorates to Hong Kong research universities.

Research Productivity and Academic Training

Academic productivity depends on demographics (age, gender, family background), training and experience in academic research (advanced degrees and research experience), current academic status, preference for research, workload and time input, funding support, research collaboration, and institutional characteristics (e.g., Dunder and Lewis 1998; Toutkoushian and Webber 2011). Among these factors, as Buchmueller et al. (1999) argued, academic and research training have not been sufficiently investigated while the demographics, current status and personal profile, and institutional characteristics have been empirically studied in some depth. This is because the internal academic and research training process is less well-known, and until now, researchers have considered it as black box.

As Enders (2005) and Bess (1978) have argued, academic training, in particular Ph.D. programs and early career research experience, is highly associated with future academic activity. The socialization and professionalization processes during study abroad in academically advanced countries provide academic capital benefits for a career of publishing in international journals. Research performance is improved by integration into transnational professional networks, professional linkages with colleagues and supervisors in overseas country where the doctorate was earned, access to existing knowledge-producing networks, and more opportunities for international scientific cooperation (e.g., Jonkers and Tijssen 2008).

In addition, opportunities for post-doctoral study abroad have increased and become part of a popular career path (e.g., Melin 2004). After all, knowledge flows are increasingly global and active participation and engagement in internationally-oriented knowledge networks is critical for absorbing the most advanced knowledge and learning methodologies for academic research and teaching practices (Mahroum 2000). According to Corley and Sabharwal (2007) and Horta (2009), academics who have post-doctoral experience are more research productive than those without the experience. Similar findings are reported by Shin and Cummings (2010). In short, postdoctoral study and experience further contributes to socialization in academic society (e.g., Melin 2004; Sambunjak and Marusic 2011).

Our research into differences in productivity between academics with foreign versus domestic doctorates is built upon a model of the main factors that affect academic productivity. In brief, these factors are individual and institutional in nature, as proposed by Dunder and Lewis (1998) and Toutkoushian and Webber (2011). For example, evaluation policy and reward systems not only influences promotion decisions but also reinforces future academic research and grant applications (Braxton et al., 2002). In addition, the culture of a department or institution, including factors such as participative governance, academic freedom, decentralized organization, and accessibility of resources have been found to determe research performance of individual faculty (e.g., Cresswell, 1985; Bland and Ruffin, 1992; Smeby and Try 2005). As well as these individual and institutional factors, studies (e.g. Piro et al. 2013; Shin and Cummings 2010) also pay attention to disciplinary difference across fields, specifically as it concerns quantity, dissemination mechanisms, and collegial collaboration.

Method

Data

The data for this study is based on the survey of the Changing Academic Profession (hereafter CAP), which was conducted in 2007-2008. The survey examined the nature and extent of the changes experienced by the academic profession in recent years within 19 higher education systems. We selected three Asian higher education systems: Korea, Malaysia, and Hong Kong. The original sample was 900 for Korea, 749 for Hong Kong, and 1,171 for Malaysia, respectively. We limited our analysis to only full-time university academics with doctoral degrees. We exclude part-time academics, non-doctoral degree holders, and those working in higher education institutions other

than universities. After filtering the data, the sample size for the three systems combined of 2,763 was reduced to 1,942, specifically, 877 in Korea, 632 in Hong Kong, and 433 in Malaysia.

We limited the analysis to only academics working in the same country as their birth place and compared the research productivity of domestic degree holders and returning academics with doctorates earned abroad. We excluded foreign academics who are working in a country different from their birth place, as these mobile academics differ from returnees from study abroad in terms of their scholarships, perception, and academic activities. On this basis, our sample was further downsized to 868 for Korea, 417 for Hong Kong, and 378 for Malaysia, respectively. Most of these returnees received their doctorates from an advanced higher education systems (e.g., USA, UK, Germany, France, Australia, Canada). Among the Korean sample, 96.5% earned their doctoral degree from an advanced higher education system. The figure for the Malaysian sample is 94.2%, and it is 92.8% for the Hong Kong sample. The details of our sample are presented in Table 1.

[Table 1 is here.]

Variables

The number of refereed journal articles, authored or edited books and book chapters published in the past three years (2005, 2006, and 2007 for Korea, and 2004, 2005, and 2006 for Malaysia and Hong Kong) was selected as a dependent variable based on self-reported CAP survey data. Refereed journal articles are a primary measure of research output, and some fields, especially arts and humanities and social sciences place heavier emphasis on books or book chapters, thus a summed set of journal articles, books and book chapters is chosen as a dependent variable to consider different publication formats across disciplines as Webber (2012) proposed. In addition, a simple summation method in counting publication is a better method in international comparative study than a weighted method because weighting schemes differ across countries depending on their policy contexts. Regardless of method, the mean number of publications widely differs across the higher education systems. For example, over the three years preceding the survey, academics in Korea published an average of 11.98 papers, while academics in Malaysia published an average of 7.32 papers.

Our independent variable is categorical with three categories—academics with domestic Ph.D.s, academics with foreign Ph.D.s, and academics with foreign Ph.D.s and foreign post-doctoral experience. We categorized foreign Ph.D.s into two categories—with and without foreign post-doctoral experience. In our model, the domestic Ph.D.s is the reference group and both other categories are dummy-coded. Through the coding process, our analytical model includes foreign Ph.D.s and foreign Ph.D.s with foreign post-doctoral experience. In addition, we classified academic disciplines by soft (e.g., arts and humanities, social sciences) and hard (e.g., natural science, engineering, medical sciences) disciplines to analyze how research outputs differ by disciplines.

In addition, we included individual and institution level variables to control for the effects of these variables on the dependent variable. In this respect we were guided by the CAP related analyses that controls for the factors of research productivity (ANY CITATION HERE?). The individual level variables are gender, faculty rank, research preference, faculty workload (time on research), and international collaboration. The institution level variables are institutional mission (teaching or research oriented university), research funding, performance-based management and academic freedom. Among the four institution level variables, research funding support, academic freedom, and performance-based management are measured on a five point Likert scale where the endpoints are strongly disagree and strongly agree. Table 2 shows the descriptive statistics for the dependent and independent variables, as well as the means and standard deviations of the variables.

[Table 2 is here.]

Analytical Method

We developed three different analytical models. Model 1 is a baseline model, and model 2 analyzes how the coefficients differ between hard and soft disciplines. Model 3 is developed to test whether research productivity differs between the three groups--domestic PhDs, foreign PhDs, and foreign PhDs with foreign post-doc experience. In the model 2, we exclude academic discipline from the model 1, because model 2 formulated one for hard and the other one for soft discipline. Model 3 has two sub-models: model 3-1 and 3-2. Model 3-1 tests the differences between three groups, and model 3-2 analyzes research productivity of hard and soft disciplines separately.

Model 1 (total sample):

Research outputs = f (gender, academic rank, research preference, time on research, international collaboration, academic discipline, institutional mission, research funding support, academic freedom, performance based management)

Model 2 (by hard and soft discipline):

Research output = f (gender, academic rank, research preference, time on research, international collaboration, institutional mission, research funding support, academic freedom, performance based management)

Model 3 (testing of research questions):

Model 3-1: Model 1 + (foreign PhD without foreign post-doc experience, foreign PhD with foreign post-doc experience)

Model 3-2: Model 2 + (foreign PhD without foreign post-doc experience, foreign PhD with foreign post-doc experience)

Our analytical method is a negative binominal regression analysis. Statisticians (e.g., Raudenbush and Bryk, 2002) recommend applying multilevel analysis to analyze multi-level data structures; however, they also discourage applying multilevel analysis when there is small number of groups at the upper levels. According to the CAP data, Hong Kong, because of its small size, has only nine universities represented in the data set. Thus, the regression analysis is appropriate for this data structure with a small number of groups -- universities in this study. In addition, we applied binominal regression analysis rather than OLS regression as our analytical method because our dependent variable—research productivity—shows a positively skewed distribution (Poisson distribution).

Results

Descriptive statistics

Table 3 shows the descriptive statistics for outcome variables, grouped by domestic PhDs, foreign PhDs without foreign post-doctoral experience, and foreign PhDs with foreign post-doctoral experience. We excluded the foreign PhDs without foreign post-doctoral experience in the Malaysia data due to multicollinearity--almost all the foreign PhDs in Malaysia have foreign research experience after earning their PhDs. As shown, academics with foreign PhD degrees and foreign post-doctoral experience are relatively productive, while academics with foreign PhDs without foreign post-doctoral experience are the least productive in terms of number of publications. The results slightly differ between hard and soft disciplines in these three countries. There is a consistent result with respect to domestic PhDs being more productive than foreign PhDs without foreign post-doctoral experience in Korea.

[Table 3 is here.]

Regression Analysis

We conducted a binominal negative regression analysis to test the difference in academic productivities among the three groups and the results are reported in Table 4. When all the independent and dependent variables are entered into regression model 1, we found that most individual variables such as academic rank, research preference, time spent for research, and research collaboration are statistically significant, although levels of significance differs slightly across systems. Only a few factors at the institutional level are significant enough to explain research productivity. Institutional mission is significant only in Korea and research funding support is positively associated with the research productivity among Korean academics. In our second step of the analysis (model 2), we split the data by hard and soft disciplines and entered all of the same variables into the analysis, except academic disciplines. The results are slightly different between hard and soft disciplines.

At our final stage (model 3), we tested whether foreign PhDs are more research productive than the domestic PhDs (model 3-1). The negative binominal regression reveals no difference in research productivity between foreign and domestic PhDs in Hong Kong. On the other hand, the regression results shows that foreign PhDs publish less than their domestic counterparts in Korea unless they have foreign experiences after earning their PhDs. Again, due to multicollinearity, we excluded foreign PhDs without foreign post-doctoral experiences in our analysis for Malaysia.

We conducted a follow up analysis (model 3-2) to compare how the regression results differ between hard and soft disciplines. According to the analysis, the Korean academics with foreign PhDs published a smaller number of papers over a three years period compared with academics who earned domestic PhDs in soft disciplines, but there is no difference between domestic and foreign PhDs in the hard disciplines. However, the difference is considerably larger for Malaysian academics in the hard disciplines. In particular, foreign PhDs without foreign research experience publish far less than their peers with domestic PhDs over a three year period.

[Table 4 is here.]

Discussion

This study found that domestic PhDs compare favorably with foreign PhDs in research productivity in Korea and Hong Kong, and even more so in Malaysia. These findings which rely on the international CAP data base do not confirm results found in previous studies (e.g. Glanzel 2001; Horta 2009; Jonkers and Tijssen 2008). One might question our measure of research productivity which gives equal weight to domestic and international publications in measuring research productivity. However, when we conducted the same analysis of Korean academics with data that identifies both international and domestic publications, our results were no different, even when the analysis was more heavily weighted toward international publications. Publishing in international journal is more difficult and highly weighted in many non-English speaking countries including Korea where international publication is strongly encouraged (e.g. Shin and Cummings 2010). However, the findings of this study require more in-depth theoretical discussion rather than a singular focus on the issue of weighting between domestic and international publications.

The neoliberal perspective assumes that human being improves their capacity through education and training, and their increased value is evaluated and rewarded in the job market (Levidow 2002; Torres and Schugurensky 2002). On the other hand, the positional competition perspective argues that higher social status people use education to add or maintain their socio-culture credentials in global competitions, as Brown (2000) argued. Study abroad could be explained on the basis of either neoliberalism or positional competition. If returnees from study abroad are more productive, neoliberal theory makes sense; if not, the positional competition perspective is a more powerful explanatory framework. The findings of this study seem to support the positional competition perspective. Yet, the question as to why the positional competitive perspective makes more sense in these three East Asian higher education systems deserves further attention. These countries have a high proportion of foreign degree holders within their higher education systems. This is because foreign degrees are highly regarded as a status symbol in these societies, especially in the Neo-Confucian cultures of Korea and Hong Kong.

Yet, there is also an alternative interpretation. The most competitive academics prefer to stay in the advanced higher education systems rather than return to their home country because the advanced higher education systems provide a more congenial research environment. This is why foreign scholars are more research productive in the advanced higher education systems as some studies have found (e.g. Glanzel 2001; Webber 2012). Of course, cases may differ by locality. For example, some Hong Kong academics return to Hong Kong because of the well-endowed infrastructure of laboratories and libraries, and the especially strong protection of academic freedom. Some experience a glass ceiling as foreigners in overseas research universities, whereas this would not be the case in Hong Kong, where they receive competitive salaries and better access to research facilities. Thus, the question of who stays abroad and who returns becomes a key analytical category. East Asian countries (e.g., Korea, China mainland, Taiwan) have initiated ways to entice well-established researchers to return home from abroad by providing better research environments including research funding. On the contrary, voluntary returnees may be less well regarded at entry level in these countries (e.g., Shin and Jang, 2013).

Interpretations based on either positional competition or neo-liberalism do not sufficiently explain the reality experiences in the the academic world by returnees. There is more than human capital training or status competitions at work in explaining research productivity of foreign PhDs in their home countries. For example, foreign PhDs may have difficulty in adjusting themselves to new research environments. The academic culture, infrastructure, and funding mechanism in their home country may differ from that in the country where they received their advanced academic training (e.g., Ilon, 2013). Returnees may also have difficulty in developing their research topics after returning to their home country. During this absence, they are 'out of sight, out of mind', less locally networked, and not updated on with trends 'back home' (Blacki, 1992). This becomes more of a factor as universities have to generate more of their income based on the relevance of their research to local and national development. This is especially the case in the social sciences where contextualized research is highly encouraged. Similarly, returnees with foreign PhDs and foreign post-doctoral experience are less productive than their colleagues with domestic PhDs in the hard disciplines in Malaysia. As Vandermoere and Vanderstraeten (2012) point out, scientific communication and network patterns greatly differ across academic disciplines. In addition, this is partially related with national context factors, such as tenure, promotion, and research evaluation system.

Nevertheless, research productivity of scholars in Korea and Hong Kong was quite remarkable among scholars in the participating countries of the international CAP survey. In both places, the academic productivity of those with both domestic and foreign PhDs was very high and rapidly on rising. However, this interpretation runs up against the Malaysian data where research productivity is much lower. Such differences hinge upon social contexts and policy initiatives as Shin and Kehm have argued (2013). Korean universities use Korean as the medium of instruction and foreign academics are seldom if ever hired as regular professors though the share of foreign scholars has grown in recent years. Instead, Korean universities hire a very large share of foreign PhDs (about 40% of the professoriate in four year universities). Formerly a sign of academic excellence until the mid-2000s, the luster of foreign degrees has become moderated as the Korean government began to adopt performance-based budget systems. Korea has instituted a series of research funding systems to build world-class universities equivalent to her status in the global economy (e.g., Shin and Jang, 2013). In this context, domestic degree holders began to publish more actively in international as well as domestic journals to compete with foreign degree holders. Through such initiatives, the competition between Korea's domestic and returnee PhDs has intensified and driven up the research productivity of Korean academics to levels above the 19 countries in the international CAP survey.

As a major global city, Hong Kong hires research productive academics from an internationally competitive scholar market. The use of English, a high level of economic development, competitive salaries, an open border, and a westernized academic environment that protects academic freedom enable Hong Kong to attract talent from anywhere in the world (Postiglione 2013). As its research universities have achieved global ranking, they have begun to produce a larger share of the doctorates of the Hong Kong professoriate. Academics who earn their doctorates in Hong Kong can take advantage of the fact that its research universities have become deeply integrated into international knowledge networks, which is also helped by visa free access and world class communication infrastructure. The high threshold of overseas trained PhDs in Hong Kong, coupled with the high level of trust in the performance based criteria used to assess decisions about promotions and resource allocation has provided a

more level playing field for the increasing number of locally trained PhDs from Hong Kong's globally recognized top tier universities (Postiglione and Wang 2013). As the number of highly capable domestic doctorates increases, the risk of academic inbreeding also increases. The day will come when the Chinese mainland will have enough globally competitive research universities to decrease inbreeding, which could also be of benefit to Hong Kong, especially as English becomes used more in the hard science fields on the Chinese mainland.

The Malaysia case can be explained from a different perspective. In spite of the significant increase in Malaysia research performance in recent years (Nguyen and Pham 2011), Malaysian academics are not especially productive in the level of output of research publication (Azman et al., 2014; Hassan, et al., 2008). There is increased pressures to not only invest more heavily in developing scientific talent and training a cadre of young academics for the future (Knight and Sirat 2011). There is also a need to raise the productivity and efficacy of their research activities particularly in terms of raising the level of output of research publication (Azman et al., 2014). Without a more developed research environment in Malaysia, returnees with doctorates may not assimilate well into the Malaysian academic world. This may be why foreign doctorate holders who return to Malaysia are less productive in hard disciplines than their domestic counterparts. Unmet expectations result more often in Malaysia where those in the hard sciences require high quality research labs and equipment (e.g., Sirat, 2013). In addition, foreign degree holders whose research agenda remains closely tied to research projects in the overseas host countries where they earned their doctorates may have more difficulty in contextualizing their research to address local problems in Malaysia. In some cases, they have to renegotiate their research areas to align more closely with local research needs. The higher research productivity level of domestic degree holders can also be attributed to staying connected more closely to the domestic development climate, and personal networks that are advantageous in joining research teams and obtaining research grants from government resources. These findings suggest that resocialization back into the domestic research environment is central to future productivity of the Malaysian academics trained abroad. The development of peer relations, the existence of a network of connections, the formation of a research orientation, experience as a graduate research student, and influence of team-based research all contribute positively to future career productivity as Hunter and Kuh (1987) and Hu and Gill (2000) discussed.

Summary and Implications

The high research productivity of domestic PhDs in Korea and Hong Kong can be attributed to their advanced economies, research environments, and the rising academic capacity of their higher education systems. The more modest research productivity of Malaysian academics with foreign PhDs can be attributed in part to the less endowed infrastructure for research in its universities. Theoretical discussions from sociology or economics have been unable to fully explain the productivity returns on the returnees' investment into PhD study abroad.

Positional competition has been useful to explain much of the motivation for study abroad in East Asia. However, it is becoming less persuasive for explaining the research performance after returning home. Foreign degrees were formerly a guarantee of access to an academic post in many Asian countries. However, change is underway. One reason concerns the oversupply of foreign PhDs. Despite the rapid expansion of Asian higher education systems, a foreign degree alone is insufficient for access to the academic labor markets in Asian research hubs. The research capacity of domestic PhDs has been helped by both internationalization and the improved access to knowledge networks due to internet globalization. This has helped narrow the gap between holders of domestic and overseas doctoral degree holders. Another determining feature for closing the gap has been government initiatives to establish assessment systems that emphasize knowledge exchange with the surrounding society. Thus, domestic degree holders have improved their competitive edge with foreign degree holders in a manner that also results in mutually reinforcement and overall improvement in research productivity.

Neo-liberal perspectives argue that PhD training overseas in advanced countries enhances academic capability and research productivity. However, the data for Korea and Hong Kong question whether academic training in advanced countries does in fact guarantee higher levels of productivity of returnees than their domestically trained counterparts. In the case of Malaysia, returnees may even be less productive than domestic

degree holders when research infrastructures is significantly lacking. While study abroad may contribute to enhanced academic capability, that capability does not automatically translate into high performance if environments are not set in place to facilitate high level research.

In the coming decades, the growth of graduate programs in East Asia's rapidly rising economies will affect study abroad patterns. This will bring significant change to the global higher education market because these countries are the major driver of international student mobility. According to UNESCO (2012) data, about one and half million Asian students were studying abroad in 2011. In addition, faculty hiring patterns in East Asia have begun to change as academic performance, including domestic relevance and knowledge transfer, become the main criteria for the recruitment and promotion of faculty. As a result, the advantages of foreign degrees will continue to fade. Having a foreign PhD is no longer as important as research performance in Korean universities, as is fast becoming the case in the Chinese mainland, Taiwan and Singapore. Moreover, as East Asia becomes the main driver of global economic growth by mid-century, the majority of advanced degrees earned overseas may very well be in neighboring Asian countries rather than elsewhere.

Although this study has addressed the issue of academic mobility and study abroad, it was conducted with certain limitations related to the data used in the analysis. The research productivity data are taken from self-reported data rather than bibliometric data. Although self-reported research productivity data is reliable and often used for research on academic productivity, (e.g., Shin and Cummings 2010; Smeby and Try 2005) it is not as precise as bibliometric data. We also did not include duration of prior research experience, e.g., years of post-doctoral experience because that data is unavailable from the CAP data base. In addition, we classified academic disciplines by hard and soft dimension because the CAP data base does not allow further classification, such as pure and applied. Follow up studies that address these limitations can provide improved results. Finally, further research might apply weighting schemes across different types of research outputs.

References

- Altbach, Philip, G. 1981. The university as center and periphery. *Teachers College Record* 82(4): 600-621.
- Arnove, Robert, F. 1980. Comparative education and world-systems analysis. *Comparative Education Review* 24(1): 48-62.
- Azman, Norzaini, Pang, Vincent, Sirat, Morshidi, and Yunus, Aida Md. 2014. Teaching and research in Malaysian public universities: Synergistic or antagonistic? In J. C. Shin, A. Arimoto, W. K. Cummings and U. Teichler (Eds.). *Teaching and research in contemporary higher education: Systems, activities and rewards*. Springer: Netherland.
- Bennion, Alice, and Locke, William. 2010. The early career paths and employment conditions of the academic profession in seventeen countries. European Review (Supplement on the Academic Profession). *Journal of the Academia Europaea* 18(1): S7-S33.
- Bess, James, L. 1978. Anticipatory socialization of graduate students. *Research in Higher Education* 8(4): 289-317.
- Blacki, J. Stewart. 1992. Coming home: the relationship of expatriate expectations with repatriation adjustment and job performance. *Human Relations* 45(2): 178-192.
- Bland, Carole J, and Ruffin, Mack T. 1992. Characteristics of a productive research environment: Literature Review. *Academic Medicine*, 67(6): 385-397.
- Bratsberg, Bernt. 1995. The incidence of non-return among foreign students in the United States. *Economics of Education Review* 14(4): 373-384.
- Braxton, John M, Luckey, William, and Helland, Patricia. (2002). Institutionalizing a broader view of scholarship through Boyer's four dimensions. *ASHE-ERIC Higher Education Report* 29(2): JOSSEY-BASS.
- Brown, Phillip. 2000. The globalization of positional competition? *Sociology* 34(4): 633-653.
- Buchmueller, Thomas C, Dominitz, Jeff, and Lee Hansen W. 1999. Graduate training and the early career productivity of Ph.D. economists. *Economics of Education Review* 18(1): 65-77.

- Cantwell, Brendan, Luca, Sandra G, and Lee, Jenny, J. 2009. Exploring the orientations of international students in Mexico: Differences by geographic region of origin. *Higher Education* 57(3): 335–354.
- Carrington, William, J, and Detragiache, Enrica, D. 1998. How big is the brain drain? *IMF Working Paper* 98/102: 1-27.
- Corley, Elizabeth A, and Sabharwal, Meghna. 2007. Foreign-born academic scientists and engineers: producing more and getting less than their US-born peers? *Research in Higher Education* 48(8): 909-940.
- Cresswell, J. W. (1985). Faculty research performances: Lessons from the science and social sciences (ASHE-ERIC Higher education Report No.4). Washington, DC: Association for the Study of Higher Education.
- Cummings, William K. 1994. From knowledge seeking to knowledge creation: the Japanese university's challenge. *Higher Education* 27(4): 399-415.
- Dundar, Halil, and Lewis, Darrell R. 1998. Determinants of research productivity in higher education. *Research in Higher Education* 39(6): 607-631.
- Enders, Jürgen. 2005. Border crossings: Research training, knowledge dissemination and the transformation of academic work. *Higher Education* 49(1/2): 119–133.
- Finn, Michael G. 2007. Using NSF data on scientists and engineers to estimate stay rates of foreign doctorate recipients. Paper presented at the Workshop for Using Human Resource Data from Science Resources Statistics. National Science Foundation, VA. Ridge Institute for Science and Education.
- Glanzel, Wolfgang. 2001. National characteristics in international scientific co-authorships. *Scientometrics* 48(2): 121–150.
- Hassan, Aminuddin, Tymss, Peter, and Ismail, Habsah. (2008). Academic productivity as perceived by Malaysian academics. *Journal of Higher Education Policy and Management* 30(3): 283-296.
- Hirsch, Fred. 1976. *Social limits to growth*. Cambridge, MA: Harvard University Press.
- Ho, Kong Chong. (2013). Peering through the dust of construction: Singapore's efforts to build WCUs. In Jung Cheol, Shin and Barbara. M Kehm (eds.). *Institutionalization of world-class university in global competition*. Springer. pp. 225 – 236.
- Horta, Hugo. 2009. Holding a post-doctoral position before becoming a faculty member: does it bring benefits for the scholarly enterprise? *Higher Education* 58(5): 689-721.
- Horta, Hugo, Sato, Machi, and Yonezawa, Akiyoshi. 2011. Academic inbreeding: exploring its characteristics and rationale in Japanese universities using a qualitative perspective. *Asia Pacific Education Review* 12(1): 35-44.
- Hunter, Deborah E, and Kuh, George D. 1987. The "Writing Wing": Characteristics of prolific contributors to the higher education literature. *The Journal of Higher Education* 58(4): 443-462.
- Hu, Qing, and Gill, T Grandon. 2000. Is faculty research productivity: Influential factors and implications. *Information Resources Management Journal (IRMJ)* 13(2): 15-25.
- Ilon, Lynn. 2013. Integrating international faculty into Korea's top national university. Unpublished research report (Seoul National University).
- Jonkers, Koen and Tjsssem Robert. 2008. Chinese researchers returning home: Impacts of international mobility on research collaboration and scientific productivity. *Scientometrics* 77(2): 309-333.
- Kim, Jongyoung. 2011. Aspiration for global cultural capital in the stratified realm of global higher education: why do Korean students go to US graduate schools? *British Journal of Sociology of Education* 32(1): 109-126.
- Knight, Jane, and Sirat, Morshidi. 2011. The complexities and challenges of regional education hubs: Focus on Malaysia. *Higher Education* 62(5): 593-606.
- Le, Thanh. 2008. 'Brain drain' or 'brain circulation': Evidence from OECD's international migration and R and D spillovers. *Scottish Journal of Political Economy* 55(5): 618-636.

- Lee, Jenny. J, and Kim, Dongbin. 2010. Brain gain or brain circulation? U.S. doctoral recipients returning to South Korea. *Higher Education* 59(5): 627-643.
- Levidow, Les. 2002. Marketizing higher education: neoliberal strategies and counter-strategies. In Robins, Kevin and Webster Frank (eds.). *The virtual university? Knowledge, markets and management*. Oxford, UK: Oxford University Press. pp. 227-248.
- Mahroum, Sami. 2005. The international policies of brain gain: A review. *Technology Analysis and Strategic Management* 17(2):219-230.
- Malaysia. (2010). *The Ninth Malaysia Plan, 2011-2015*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Melin, Göran. 2004. Postdoc abroad: Inherited scientific contacts or establishment of new networks. *Research Evaluation* 13(2):95-102.
- Nguyen, Tuan V., and Pham, Ly T. 2011. Scientific output and its relationship to knowledge economy: an analysis of ASEAN countries. *Scientometrics* 89(1): 107-117.
- Piro, Fredrik Niclas, Aksnes, Dag W, and Rørstad, Kristoffer. 2013. A macro analysis of productivity differences across fields: Challenges in the measurement of scientific publishing. *Journal of the American Society for Information Science and Technology* 64(2): 307-320.
- Postiglione, Gerard A. 2013. Anchoring Globalization in Hong Kong's Research Universities: Network Agents, Institutional Arrangements and Brain Circulation. *Studies in Higher Education*. Vol. 38. No. 3. pp. 345-366.
- Postiglione, Gerard and Wang, Shiru. 2011 Governance of the Academy in Hong Kong. in William Locke, William Cummings and Donald Fisher. ed, *Changing Governance and Management in Higher Education* Springer Press. 343-68.
- Postiglione, Gerard A, and Jung, Jisun. 2013. Frameworks for creating research universities: The Hong Kong case. In J. C. Shin and B. M Kehm (eds.). *Institutionalization of world-class university in global competition*. Springer. pp. 237-256.
- Raudenbush, Stephen. W, and Bryk, Anthony, S. 2002. *Hierarchical Linear Model: Applications and Data Analysis Methods* (2nd edition). Sage Publications.
- Sambunjak, Dario, and Marusic, Matko. 2011. Between forwarding and mentoring: a qualitative study of recommending medical doctors for international postdoctoral research positions. *BMC Medical Education* 11(31): 1-9.
- Saxenian, Anna Lee. 2002. Brain circulation: How high-skill immigration makes everyone better off. *The Brookings Review* 20(1): 28-31.
- Smeby, J., & Try, S. (2005). Departmental contexts and faculty research activity in Norway. *Research in Higher Education*, 46(6), 593-619.
- Shin, Jung Cheol, and Cummings, William. K. 2010. Multi-level analysis of academic publishing across discipline: research performance, collaboration, and time on research. *Scientometrics* 85(2): 582-594.
- Shin, Jung Cheol, and Jang Yong Suk. 2013. World class university in Korea: Proactive government, responsive university, and procrastinating academics. In J. C. Shin and B. M Kehm (eds.). *Institutionalization of world-class university in global competition*. Springer. pp. 147-164.
- Shin, Jung Cheol, and Kehm, Barbara. M. 2013. *Institutionalization of world-class university in global competition*. Springer.
- Sirat, Morshidi. 2013. Malaysia's world-class university ambition: An assessment. In Jung Cheol, Shin and

- Barbara.M.Kehm (eds.). *Institutionalization of world-class university in global competition*. Springer. pp. 205-224.
- Tilak, Jandhyala B. G 2011. *Trade in higher education: The role of the General Agreement on Trade in Services (GATS)*. UNESCO: International Institute for Educational Planning. UNESCO: Paris.
- The World Bank. (2007). *Malaysia and the Knowledge Economy: Building a World-class Higher Education System*. Washington: The World Bank. Accessed 5 November 2010 from <http://web.worldbank.org>.
- Torres, Carlos. A, and Schugurensky, Daniel. 2002. The political economy of higher education in the era of neoliberal globalization: Latin America in comparative perspective. *Higher Education* 43(4): 429-455.
- Toutkoushian, Robert. K, and Webber, Karen. 2011. Measuring the research performance of postsecondary institutions. In J. C. Shin, R. K. Toutkoushian, and U. Teichler (Eds.), *University ranking: Theoretical basis, methodology and impacts on global higher education*. Dordrecht: Springer.
- UNESCO (2012). Statistics for education: Outbound mobiles students. UNESCO Institute for Statistics. <http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=3968>. Accessed in April.29
- Vandermoere, Frédéric, and Vanderstraeten, Raf. 2012. Disciplinary networks and bounding: Scientific communication between science and technology studies and the history of science. *Minerva* 50(4): 451-470.
- Waters, Johanna, L. 2009. In pursuit of scarcity: transnational students, 'employability', and the MBA. *Environment and Planning* 41(8): 1865-1883.
- Webber, Karen. 2012. Research productivity of foreign-and US born faculty: differences by time on task. *Higher Education* 64(5): 709-729.

Table 1 Characteristics of the Study Sample

		Korea	Hong Kong	Malaysia
Original Sample (only full time academics)		900 (100.0)	749 (100.0)	1,171 (100.0)
Doctoral degree holders		877 (97.4)	632 (84.4)	433 (37.0)
Birth place	Same as current working country	868 (99.8)	417 (70.2)	378 (91.1)
PhD study	Domestic PhD	495 (57.0)	136 (32.6)	147 (34.0)
	Overseas PhD (Returnees)	372 (42.9)	268 (64.3)	207 (54.8)
Sample of this study		868	417	378

Table 2 Descriptive statistics for independent and dependent variables

Variables		Definition and measure	Korea		Hong Kong		Malaysia	
			mean	SD	mean	SD	Mean	SD
Dependent variables	Publication	(Book) + (Articles) + (Book chapters)	11.98	9.37	9.84	9.56	7.32	9.37
Research variables	Foreign PhD without foreign exp.	Foreign PhD without foreign post-doc exp.=1	0.37	0.48	0.60	0.49	0.01	0.09
	Foreign PhD with foreign post-doc exp.	Foreign PhD with foreign post-doc exp.=1	0.06	0.25	0.07	0.25	0.58	0.49
Independent variables	Gender	Male=1	0.81	0.39	0.66	0.48	0.57	0.50
	Academic Rank	Professor=1 (reference: assistant)	0.41	0.49	0.21	0.41	0.13	0.34
		Associate=1 (reference: assistant)	0.23	0.42	0.33	0.47	0.54	0.50
	Research preference	Do your interests lie primarily on research? (yes=1)	0.69	0.46	0.70	0.46	0.65	0.48
	Time on research	Research hours per week during semester	18.22	10.83	16.52	12.37	9.43	8.16
	International collaboration	Do you collaborate with international colleagues? (yes=1)	0.30	0.46	0.58	0.49	0.48	0.50
	Discipline	0=soft, 1=hard	0.47	0.50	0.45	0.50	0.73	0.44
	Mission	0=teaching, 1=research oriented	0.37	0.48	0.47	0.50	0.43	0.50
	Research funding support	5 Likert scale	2.25	1.06	2.73	1.13	2.74	1.13
	Academic freedom	5 Likert scale	3.40	0.87	3.47	1.04	3.22	1.08
Performance based management	5 Likert scale	3.74	0.86	3.74	1.02	3.62	1.01	

Table 3 Research publication across groups in three East Asian countries

	Total			Hard			Soft		
	Korea	Hong Kong	Malaysia	Korea	Hong Kong	Malaysia	Korea	Hong Kong	Malaysia
Domestic PhD	12.01	9.10	7.25	14.61	12.11	7.49	9.54	6.87	6.09
Foreign PhD without foreign research exp.	11.56	9.47	3.00	14.43	14.32	3.00	9.65	6.52	-
Foreign PhD with foreign research exp.	14.04	17.35	6.86	14.86	19.19	6.91	11.38	10.50	5.95

Table 4 Negative binominal regression results

Variables	<i>Model 1</i>			<i>Model 2</i>					
	Total			Hard			Soft		
	KR	HK	MY	KR	HK	MY	KR	HK	MY
Gender	-.104 (.057)	.275** (.099)	.130 (.124)	-.319*** (.094)	.431** (.161)	.220 (.149)	.060 (.070)	.200 (.125)	.086 (.222)
Professor	.013 (.053)	.701*** (.113)	1.266*** (.190)	.058 (.086)	.768*** (.161)	1.346*** (.222)	-.044 (.066)	.606*** (.159)	1.160*** (.377)
Associate professor	.131* (.059)	.450*** (.099)	.604*** (.133)	.067 (.093)	.609*** (.144)	.571*** (.165)	.196** (.074)	.306** (.133)	.841*** (.223)
Research preference	.261*** (.051)	.070 (.102)	.210 (.129)	.268*** (.081)	.108 (.161)	.027 (.160)	.248*** (.063)	.014 (.138)	.740*** (.208)
Time on research	.005* (.002)	.005 (.003)	.003 (.007)	.004 (.003)	.006*** (.004)	.003 (.008)	.006* (.003)	.006 (.005)	-.007 (.014)
International collaboration	.252*** (.051)	.290** (.093)	.244* (.117)	.199** (.074)	.465** (.149)	.272 (.142)	.295*** (.069)	.200 (.120)	.126 (.189)
Discipline	.332*** (.047)	.508*** (.094)	.084 (.137)	-	-	-	-	-	-
Mission	.110* (.059)	-.041 (.087)	.112 (.086)	.093 (.090)	-.216 (.124)	.063 (.092)	.131 (.078)	.172 (.122)	.636 (.334)
Research funding support	.057** (.022)	.050 (.039)	.092 (.058)	.098** (.034)	.085 (.055)	.078 (.071)	.027 (.028)	.024 (.058)	.141 (.092)
Performance based management	.019 (.026)	-.029 (.043)	-.041 (.065)	.010 (.044)	-.055 (.064)	-.064 (.080)	.030 (.033)	-.001 (.060)	-.028 (.110)
Academic freedom	.020 (.027)	-.023 (.041)	-.104 (.064)	-.008* (.042)	-.029 (.064)	-.172* (.077)	.040 (.033)	.001 (.055)	-.065 (.105)
Model 3									
Foreign PhD only	-.101* (.049)	-.152 (.094)	-	-.091 (.079)	-.214 (.143)	-	-.119* (.059)	-.165 (.131)	-
Foreign PhD with foreign research exp.	.111 (.096)	.046 (.172)	-.132* (.123)	.076 (.116)	-.002 (.204)	-.164* (.149)	-.106 (.211)	.104 (.391)	-.105 (.200)
Inalpha	-1.180 (.062)	-.832 (.103)	-.468 (.119)	-.997 (.085)	-.851 (.139)	-.381 (.134)	-.149 (.098)	-.923 (.160)	-1.097 (.283)
alpha	.307 (.019)	.435 (.045)	.627 (.074)	.369 (.031)	.427 (.059)	.683 (.092)	.226 (.022)	.397 (.063)	.334 (.095)

- Coefficient (Standard error)
- *p<0.05, **p<0.01, ***p<0.001