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Research Performance, Collaboration, and Movement of Researchers in the Field of Business and Management: A Comparison between International and Domestic Migrants in East Asia

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Abstract

This study examines differences in research performance, international collaboration, and migration moves between two types of migrant researchers: international and domestic migrant researchers. The investigation focuses on 929 researchers in the field of business and management in four East Asian countries—China, Japan, South Korea, and Taiwan—and explores their scientific output and movements across types of institutions. The study uses bibliographic data from the Web of Science and Scopus author ID to disambiguate information across databases. The findings reveal that both international and domestic migrants demonstrate comparable productivity. Concerning publication quality, international migrants exhibit a higher citation impact, and researchers from Taiwan demonstrate the highest average number of citations per paper among the four countries. For international collaboration, international migrants report a higher rate of international collaboration than domestic migrants. The United States serves as the primary collaborative partner for migrant researchers from Taiwan, Japan, and South Korea, whereas China has a closer partnership with Hong Kong. Finally, international migrants demonstrate a higher frequency of migration, with an average of two moves per capita. This study provides empirical evidence for the value of scientific migration from the perspectives of international and domestic migrants in East Asian countries.

Keywords: Academic Mobility; International Migrant; Domestic Migrant; Bibliometrics; Business & Management

1. Introduction

Scientific migration, also known as academic migration, is a multifaceted research topic that encompasses diverse disciplines. It focuses on the impact of academic talent, such as scientists, researchers, academic workers, and students, on knowledge communication, interpersonal connections, and economic development. Evaluations of this impact have valuable implications for policymakers and governmental bodies formulating relevant laws and policies. This study defines scientific migration as the relocation of academic talent who belong to a specific country and institution

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from their former workplace to a new institution. Researchers who exhibit such scientific migration behaviors are termed migrant researchers (Czaika & Orazbayev, 2018; Moed et al., 2013; Moed & Halevi, 2014).

The growing academic interest in migration studies has led to numerous publications on scientific migration encompassing various aspects including research performance, scientific collaboration, and migration flows. Studies have consistently found that scientific migration positively impacts research performance, particularly research productivity and quality (Ejermo et al., 2020; Halevi et al., 2016). Aksnes et al. (2013) reported that the number of publications is significantly higher for migrant researchers than for non-migrant researchers.

Furukawa et al. (2011) analyzed researchers' migration and collaboration by combining the migration and collaboration networks and found that overlapping connections between the two networks constitute 17% to 30%. In other words, there may be hidden connections among institutions or countries that are brought to light by research on collaboration and migration. It is possible that migration leads to collaborations or that collaboration promotes migration behaviors. Chinchilla-Rodríguez et al. (2018) found that researchers who have a larger international cooperation network have moved to a greater number of countries. Given the strong link between migration and internationalization, this study argues that the international collaboration of migrant researchers warrants further exploration.

Scientific migration is considered to have advantages for both researchers and their affiliated institutions (McKenna & Sikula, 1981). However, most research in this area has focused on migration between educational institutions, primarily universities, and overlooked the migration of researchers between non-academic institutions. Given that researchers in fields such as business and management are more likely to be affiliated with non-academic settings, such as research centers in corporations or the banking industry, it is crucial to examine their movement across various types of institutions.

This study examines a dataset of 929 migrant researchers in the business and management field in East Asia, including China, Japan, South Korea, and Taiwan (hereinafter CJKT). It focuses on research performance, international collaboration, migration moves, and changes in institutional affiliations. Most studies on scientific migration have examined a single type of migration, that is, international migration, whereas few have explored both international and domestic migration (Bäker et al., 2016; Gomez et al., 2020; Payumo et al., 2018). Therefore, this study aims to compare and analyze the two types of scientific migrations.

The analysis focuses on researchers in the field of business and management for the following reasons. First, in terms of the sample's disciplinary conditions, business and management are categorized under the humanities and social sciences. Early studies have rarely explored the scientific migration of researchers in the humanities and social sciences using a large-scale bibliometric data analysis, thus making it worthwhile to analyze this field further. Second, the field of business and management is highly globalized and internationalized. With the global economic development, the number of students in business schools has been annually

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increasing; thus, more faculty must be recruited to teach related courses (Callie & Cheslock, 2008; Ryazanova & McNamara, 2019). According to McKenna and Sikula (1981), business and management researchers tend to experience job transitions (e.g., job hopping or career changes), indicating that researchers in this field have more migration opportunities than those in other fields of the humanities and social sciences. According to the *Open Door* Report published by the Institute of International Education (IIE), the majority of CJKT students in the United States are studying business and management (Institute of International Education, 2021), making this field representative of researchers from these countries.

2. Theoretical Background and Research Hypotheses

King and Skeldon (2010) stated that scientific migration can be classified into two primary types: international and domestic migration. From the perspective of bibliometric analysis, international migration refers to the transfer of researchers between institutions located in different countries (i.e., from country A to country B). Domestic migration, on the other hand, is the movement of researchers between institutions within the same country. International migrants are researchers who have worked or studied in a foreign country, while domestic migrants are researchers who lack such experiences.

The notion of international migration is closely connected to globalization and is considered a crucial factor in enhancing national scientific competitiveness (Wagner & Jonkers, 2017). However, Ackers (2008) cautioned against neglecting domestic migration given its potential to facilitate knowledge exchanges. Most studies have focused on one type of migration, and there are few simultaneous analyses of both types of migration. This study aims to investigate and compare further the research performance, international collaboration, and institutional changes between international and domestic migrant researchers.

Several studies have suggested that international migrants exhibit better research performance compared with domestic researchers (Franzoni et al., 2014). Payumo et al. (2018) analyzed the performance of researchers at Washington State University and showed that migrant researchers (international and domestic migrants) outperformed non-migrant researchers. Among migrant researchers, international migrants published more papers per year compared with domestic migrants. However, the publications of domestic migrants had a higher impact than those of international migrants. It is noteworthy that Payumo et al. analyzed one university in the United States and focused on comparing research performance between migrant and non-migrant researchers. Drawing on Payumo et al., this study compares the differences in research performance between international and domestic migrants in CJKT.

Scientific migration positively affects research performance and creates more opportunities for international collaboration (Ejermo et al., 2020; Jonkers & Tijssen, 2008). Researchers who have migrated to a higher number of countries tend to collaborate with more countries and vice versa (Chinchilla-Rodríguez et al., 2018). From the human and social capital viewpoints, international experiences tend to have a favorable impact on researchers' performance and future visibility.

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Such experiences enable them to establish strong professional and personal international connections (Bäker et al., 2016; Franzoni et al., 2014). Scellato et al. (2015) observed that, compared with local researchers, foreign researchers or those who have returned to their home country tend to have a larger international collaborative network.

Previous studies have reported that international migrants tend to move more frequently compared with domestic migrants. Gomez et al. (2020), for example, analyzed data for about 116,400 scientists globally and found that scientists who migrated internationally did so more often. Chang and Huang (2023) investigated factors influencing migration moves and distances for business and management researchers and identified academic age, migrant type, and country as significant predictors of scientific migration. Their study demonstrated that international migrants tend to move more frequently and cover longer distances compared with their domestic counterparts. Drawing on Chang and Huang's findings, this study examines the differences in the number of moves between international and domestic migrants.

Given the discussion thus far, this study hypothesizes that migrant researchers with a greater number of international experiences have more publications, receive more citations, are part of a larger international collaborative network, and migrate more frequently. Accordingly, it proposes the following hypotheses:

H1.1 International migrants publish more papers compared with domestic migrants.

H1.2 International migrants have more citations compared with domestic migrants.

H2 International migrants outperform domestic migrants in international collaboration.

H3 International migrants migrate more often compared with domestic migrants.

Section 4 examines hypotheses H1.1, H1.2, H2, and H3. To validate these hypotheses, this study scrutinizes the conditions prevalent in CJKT. Section 3 discusses the dataset and methodology used to analyze the research performance and migration moves of migrant researchers. Section 5 presents the conclusions while drawing on the results and proposes prospects for future research.

3. Research Design

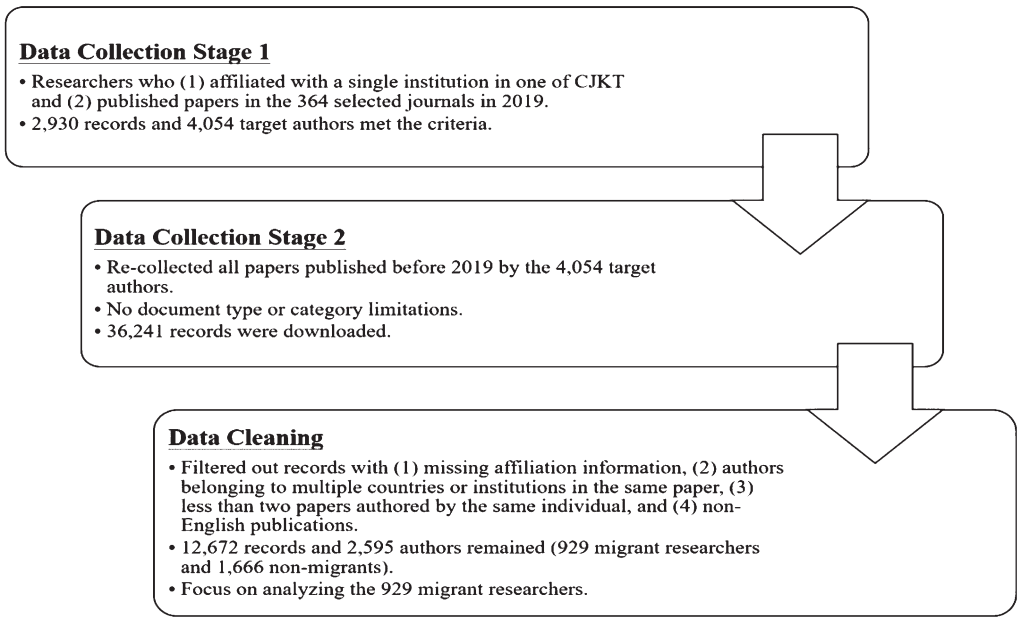
3.1 Data collection

This study adopted a bibliometric approach to examine the research publications and movements of migrant researchers from CJKT using data obtained from the Web of Science (WoS) database. The data collection process was carried out in two stages, as shown in Figure 1.

According to Robinson-Garcia et al. (2019), migrant researchers affiliated with a single country and a single institution perform best in terms of the number of publications, rate of highly cited papers, and mean normalized citation score. Thus, a sample with similar conditions was suitable for this study. To focus on researchers from the business and management field, this study selected journals from the WoS categories of "business," "business, finance," and "management." It identified 364 journals under these categories from the 2018 Journal Citation Report (JCR). In the first stage, target authors included researchers affiliated with a single institution (business schools or related institutions) in one of the four countries and who published papers in any of the

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Figure 1. The Procedure of Data Collection in this Study



364 journals in 2019. A total of 2,930 records and 4,054 authors met the criteria.

In the second stage, all papers published before 2019 by the 4,054 target authors were re-collected without using the filters of document type or category. This resulted in the download of 36,241 records. The bibliographic data from the second stage were based on the target authors identified in the first stage. The data were used to construct the migration paths of migrant researchers. All of the bibliographic records used in this study were collected between May 1st and August 31st, 2020.

Records with omitted or unidentified affiliation information, those with authors belonging to multiple countries or institutions in the same paper, and those with less than two papers authored by the same individual were excluded. Since this study used affiliation-related information from the bibliographic records to determine whether the author had migrated, each author must have at least two articles that showed such changes (Payumo et al., 2018). Given the widespread use of the English language in scientific research and publication, only English publications were included to analyze the research performance of migrant researchers in CJKT. Rao et al. (2020) showed that the number of English publications accounts for 96.1% of the WoS database (SCI, SSCI, A&HCI), whereas publications in other languages make up less than 1%. The dominance of the English language is stable and not affected by discipline. The final sample comprised 2,595 authors and 12,672 bibliographic records, with 929 migrant researchers and 1,666 non-migrants. The latter were excluded since this study focused on comparing the research performance and migration patterns of international and domestic migrants.

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3.2 Author name disambiguation

To investigate the scientific migration of researchers and accurately track individual authors across their publications, a comprehensive mapping of researchers to their publication records is necessary. The Scopus database includes articles published as early as the 1970s, and it assigns an author ID to each author by using an algorithm that matches authorship on the basis of several criteria (Aman, 2018). This identification code or Scopus author ID can be used as a search term or a basis to identify author names. Several academic attempts have been made to analyze the accuracy of Scopus' author IDs (Aman, 2018; Czaika & Orazbayev, 2018; Kawashima & Tomizawa, 2015) and have reported a recall rate and precision rate of more than 90%, proving its reliability as an identification tool for author names. Therefore, this study employed natural language processing to link articles' DOIs and titles from WoS with the Scopus database. The WoS bibliographic fields were then combined with the Scopus author ID to establish a cross-database for further analysis.

3.3 Data analysis

3.3.1 Performance indicators

The evaluation of research performance generally accounts for two dimensions: productivity and publication quality (Abramo et al., 2011; Liu & Hu, 2022). Accordingly, this study employed two indicators to examine the research performance of both international and domestic migrants in the business and management fields across CJKT:

- Relative publication rate (RPR): $RPR_{c,y}$ indicates the average number of published papers per researcher in a given country and year. $P_{c,y}$ denotes the number of papers in the country c of the year y, where c represents an individual country of CJKT, and y represents one specific year. $R_{c,y}$ is the number of active researchers in the country c of the year y.

$$RPR_{c,y} = \frac{P_{c,y}}{R_{c,y}} \quad (1)$$

- Average number of citations per paper (CPP): this indicator is calculated by dividing the total number of citations by the number of papers in a document set (Harzing, 2010). represents the number of citations of the paper , whereas is the number of papers in .

$$CPP = \frac{1}{|D|}\sum_{i=1}^{|D|} T_i \quad (2)$$

3.3.2 International collaboration indicators

Given a document set D, Q^D is a $|D| \times |C|$ matrix where $|D|$ is the number of papers in D and $|C|$ is the number of countries. $Q^D_{i,j}$ is defined as:

$$Q^D_{i,j} = \begin{cases} 0, & \text{if no author of paper } i \text{ is affiliated with country } j \\ 1, & \text{if at least one author(s) of paper } i \text{ is affiliated with country } j \end{cases} \quad (3)$$

The characteristics of international collaboration are assessed by the following three indicators:

- International co-authored papers (ICP): the number of papers which are affiliated with two or more distinct countries in a document set D. ICP is equivalent to the number of rows, which have two or more non-zero elements, in Q^D.

ICP is defined as the number of the non-one elements in , where $1_{|C|\times 1} = [1,1, ..., 1]^T$ is a vector of all 1s with length $|C|$. Each element in $Q \bullet 1_{|C|\times 1}$ must be greater than or equal to 1 since all papers in this study are authored by one or more researchers.

- International collaboration rate (ICR): ICR is the ratio of the international co-authored papers (ICP) to the total number of papers in one document set.

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$$ICR = \frac{ICP}{|D|} \times 100\% \quad (4)$$

- Number of countries involved in collaboration (NCC): NCC is the number of countries, with which one or more papers are affiliated, in a document set. NCC is equivalent to the number of columns, which have one or more non-zero elements, in Q^D.

NCC is defined as the number of the non-zero elements in $1_{1\times|D|} \bullet Q^D$, where $1_{1\times|D|} = [1,1, ..., 1]$ is a vector of all 1s with length $|D|$.

This study used a whole counting method to determine international collaboration, wherein all countries involved in collaboration were counted individually. The counting was also performed at the author level; that is, each author who contributed to a paper added to their country's collaboration score. This counting method was suitable for evaluating collaboration between migrant researchers and institutions as well as the bilateral connection between countries and affiliations (Chinchilla-Rodríguez et al., 2018).

This study focused on the flow of migrant researchers into mainland China, excluding Hong Kong and Macau, which were handed over to mainland China in 1997 and 1999. However, papers co-authored by Hong Kong and Macau researchers were considered international collaboration and counted separately for collaboration indicators.

3.3.3 Migration moves and changes of institution types

This study defined a migration event as a change in a researcher's affiliation from one institution to another as reflected in their bibliographic data. It is noteworthy that not all researchers in the humanities and social sciences publish papers on an annual basis, and this can affect the establishment of migration trajectories. To address this issue, this study employed the forward filling method to fill gaps in the data. The method involves chronologically filling in missing values from each author's first publication, thus providing an unbiased interpretation of the existing bibliographic data (Conchi & Michels, 2014).

Table 1 presents an example of how the forward filling method was used to establish the authors' affiliation information. International migrant, T00069, had one migration event. The author's first publication was in 2014, when it was affiliated with the University of Cincinnati

Table 1. Examples of Using the Forward Filling Method to Obtain Author's Affiliation Information

Year	Author	
	T00069 (International migrant)	K00252 (Domestic migrant)
2014	**University of Cincinnati (U.S.)**	**Seoul National University (South Korea)**
2015	*University of Cincinnati (U.S.)*	*Seoul National University (South Korea)*
2016	*University of Cincinnati (U.S.)*	*Seoul National University (South Korea)*
2017	**National Sun Yat-sen University (Taiwan)**	**Kwangwoon University (South Korea)**
2018	*National Sun Yat-sen University (Taiwan)*	**Kwangwoon University (South Korea)**
2019	**National Sun Yat-sen University (Taiwan)**	**Kwangwoon University (South Korea)**

Note. The boldfaced refers to the original information provided by bibliographic data (WoS) and the italicized refers to the data automatically filled by the forward filling method.

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in the United States. The 2017 record indicated that the author then migrated to National Sun Yat-sen University, Taiwan. However, there was a gap in the author's affiliation information between 2015 and 2016. The forward filling method helped determine that T00069 was still affiliated with the University of Cincinnati during 2015 to 2016.

To analyze changes in the institution type, this study classified institutions into two types. The first type comprised universities, including both public and private colleges and universities as well as their associated research institutions. The second type included non-university institutions, such as public and private research institutions, government agencies, industries, and other entities that did not fall under the abovementioned categories (e.g., societies and associations, hospitals, foundations, and independent researchers).

3.4 Data summary

Table 2 displays the distribution of migrant researchers in CJKT on the basis of their types and numbers. The table indicates that out of the 929 researchers in the study sample, 563 (60.6%) were domestic migrants and 366 (39.4%) were international migrants. Most authors in the sample had worked in different institutions within their respective countries. Among the four countries, South Korea had an almost equal proportion of international and domestic migrants, while China, Japan, and Taiwan had a higher proportion of domestic migrants. In particular, more than 70% of domestic migrants were from Taiwan and Japan, which was significantly higher than that of international migrants.

It is noteworthy that Japan had a relatively small number of authors in the sample (48 researchers). This can be attributed to Japan's system of teacher evaluation and promotion. The system mainly relies on research achievements and number of years since graduation (5 years, 8 years, and 16 years), rather than papers published in international journals, which is a small indicator of research performance (Ho, 2015). Moreover, the majority of Japan's researchers in the business and management field publish in Japanese, explaining why their publications are not included in the WoS database. Nonetheless, the large amount of bibliographic data collected under uniform conditions in this study provided a credible reflection of researchers' performance, collaboration, and migration movement.

Table 2. Number of International and Domestic Migrants in the Study Sample

Country	Types of migrant researchers					
	International migrants (%)		Domestic migrants (%)		Total (%)	
China	194	41.3	276	58.7	470	100
South Korea	109	48.7	115	51.3	224	100
Taiwan	50	26.7	137	73.3	187	100
Japan	13	27.1	35	72.9	48	100
Total	366	39.4	563	60.6	929	100

Note. Countries are ordered as per the number of international migrants.

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4. Results

4.1 Research performance of migrant researchers

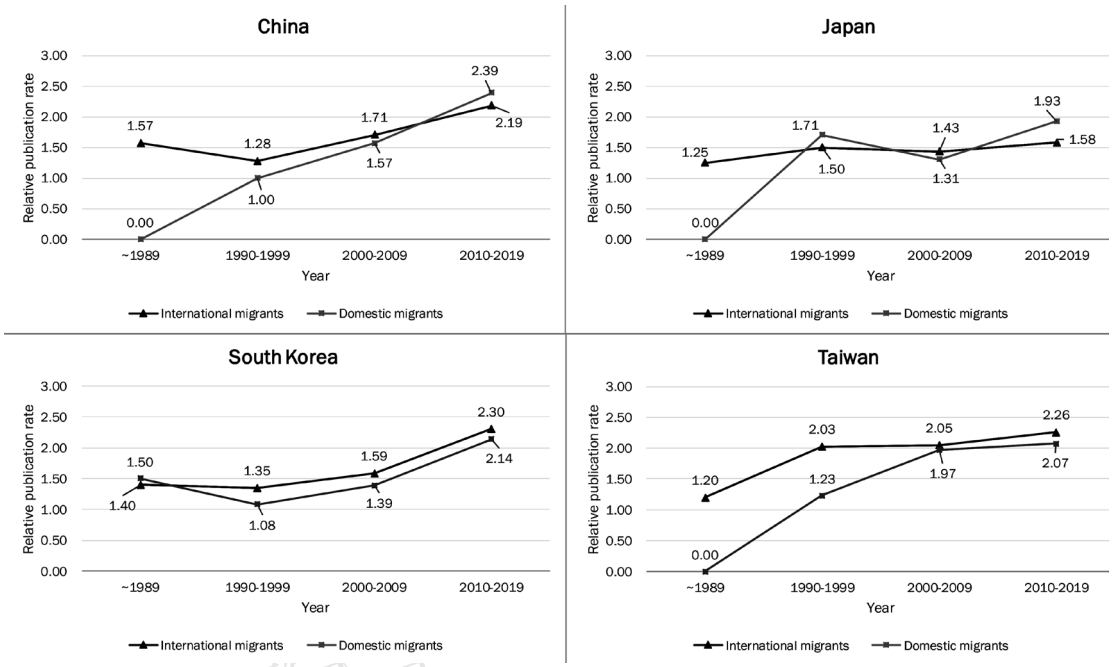
4.1.1 Research publications

A total of 366 international migrants published 5,506 papers, and 563 domestic migrants published 7,166 papers. The average number of papers was marginally higher for international migrants (M = 15.44, SD = 5.17) than for domestic migrants (M = 13.23, SD = 2.75). However, a *t* test did not find a significant difference between the two groups (p = .487), implying that the productivity performance of international and domestic migrants was comparable.

Figure 2 displays the RPR for migrant researchers from Taiwan, Japan, and South Korea for 1989 to 2019. Prior to 1990, the RPR of international migrants from Taiwan, China, and Japan was higher than those of domestic migrants, while the RPR of domestic migrants in South Korea was marginally higher than that of international migrants (-0.10). However, the RPR for domestic migrants in the four countries gradually increased between 1990 and 1999. The RPR of international and domestic migrants was roughly similar in 2010. Notably, the RPR of domestic migrants in China was 2.39, surpassing that of international migrants (2.19).

The performance of migrant researchers from Taiwan, China, and South Korea was relatively similar. China had the highest overall RPR (2.23), followed by Taiwan (2.11) and South Korea (2.05). All three countries had an RPR of more than 2, indicating that migrant researchers in these countries published an average of more than two papers per year. However, the overall RPR for Japan was 1.65 given the sample size, with

Figure 2. Relative Publication Rate of Migrant Researchers in CJKT (10-year Intervals)



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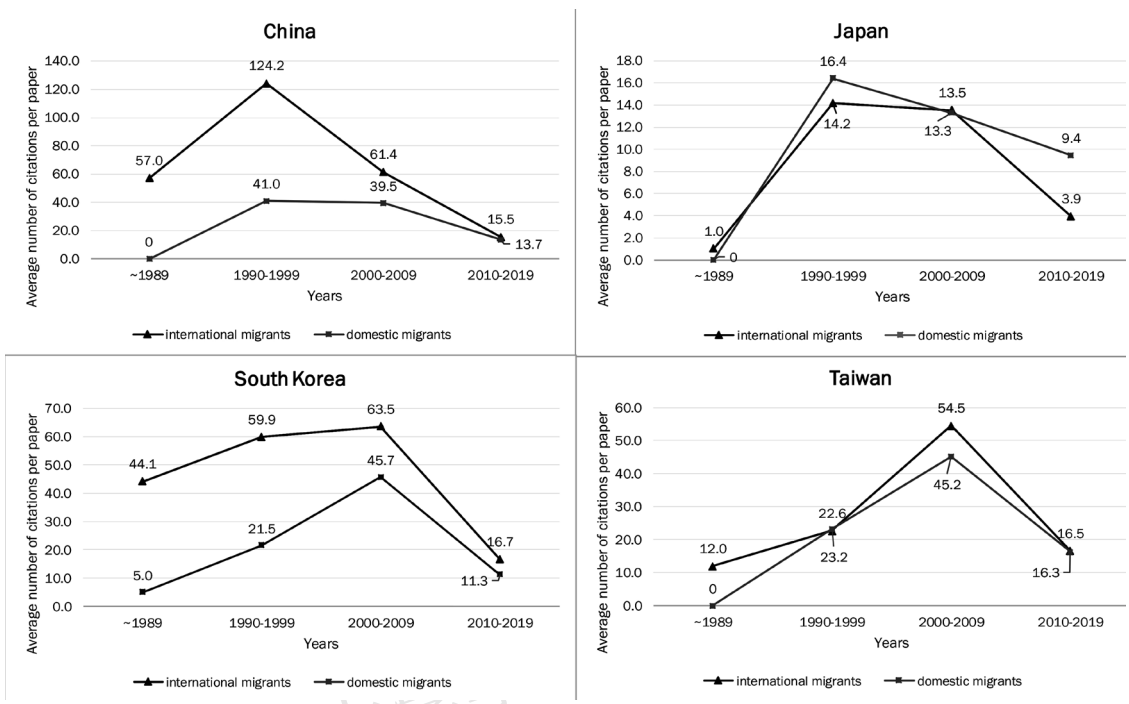
only 13 international migrants and 35 domestic migrants. Moreover, the RPR for domestic migrants was higher than that for international migrants. In summary, the results did not support H1.1 because not all international migrants from the four countries had higher publication counts when compared with the domestic migrants.

4.1.2 Citation impact

This study determined the citation impact of migrant researchers by analyzing the average number of CPP. Figure 3 displays the distribution of CPP among migrant researchers in CJKT. The results showed that international migrants in China, South Korea, and Taiwan had a higher CPP compared with their domestic counterparts. However, the performance of migrant researchers in Japan differed; that is, the CPP of domestic migrants was higher than that of international migrants. This can be attributed to differences in the number of published papers. A higher number of published papers increased the probability of being cited. In Japan, the number of papers published by international migrants was 135, which was lower than the 411 papers published by domestic migrants, indicating that the number of citations was influenced by the number of papers published.

Figure 3 shows that the CPP of international migrant researchers in China between 1990 and 1999 was 124.2. This can be largely attributed to a paper published by researcher Jiing-Lih Farh in 1997 that was cited 722 times. However, even without this influential paper, the CPP of

Figure 3. Average Number of Citations per Paper for Migrant Researchers in CJKT (10-year Intervals)



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international migrants (92.8) was still higher than that of domestic migrants during this period. Similarly, for South Korea, the CPP of international migrants was higher than that of domestic migrants, and the longer the duration and the larger the citation interval, the bigger the difference in the average citations.

To test H1.2, this study employed the Mann–Whitney U-test to compare the CPP between international and domestic migrants (Table 3). The findings revealed that in China and South Korea, the CPP was significantly higher for international migrants than for domestic migrants ($p < .001$). By contrast, in Japan, the CPP was significantly higher for domestic migrants than for international migrants ($p < .05$). These findings did not support H1.2. In Taiwan, notably, although the CPP was higher for international migrants than for domestic migrants, this difference was not statistically significant according to the Mann–Whitney U-test result ($p > .05$). This indicated that papers published by researchers in Taiwan, regardless of their migration status, had a certain level of citation impact.

4.2 International collaboration of migrant researchers

Table 4 presents the findings for the international collaboration of migrant researchers in the four countries. In particular, they showed that among the 5,506 papers published by international migrants, 2,557 had international co-authors, indicating a 46.4% international collaboration rate. Conversely, of the 7,166 papers published by domestic migrants, 2,258 had international co-authors, suggesting an international collaboration rate of 31.5%. The data indicated that the international collaboration rate

Table 3. Mann–Whitney *U*-test on the Significance of Differences in the Average Number of Citations per Paper between International and Domestic Migrants

Country	Types of migration	Number of papers	CPP	*U*	*Z*
China	International	2,470	21.2	3274852.0	-6.113***
	Domestic	2,934	14.6		
Japan	International	135	7.5	25663.5	-2.434*
	Domestic	441	10.5		
South Korea	International	1,789	25.8	1112921.0	-6.847***
	Domestic	1,446	14.9		
Taiwan	International	1,112	27.1	1256482.5	-1.729
	Domestic	2,345	23.0		
Total	International	5,506	23.5	18235225.5	-7.324***
	Domestic	7,166	17.2		

Note. CPP is the average number of citations per paper.
*$p < .05$. ***$p < .001$.

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of international migrants was higher than that of domestic migrants, with a difference of 14.9%. The distribution of collaborating countries showed that the co-authors of international migrants were distributed across 63 countries, while those of domestic migrants were distributed across 62 countries. Thus, there was no significant difference in the international collaboration between the two groups.

Table 4 further reveals that the international collaboration rate was higher for international than for domestic migrants in all four countries. China and South Korea had the highest international collaboration rates, with 55.3% and 45.1% for international migrants and 42.8% and 34.4% for domestic migrants, respectively. Domestic migrants in Taiwan had the lowest international collaboration rate (17.6%), although the country showed 31 collaborating countries, indicating a proclivity for collaboration with multiple countries on the same paper. This was also the case for Japan, where the number of collaborating countries was higher for domestic migrants than for international migrants. Overall, the results supported H2, that is, the international collaboration rate of international migrants was higher than that of domestic migrants, and the number of countries involved in international collaboration had a similar size for the two groups.

Figure 4 depicts the top five collaborating countries for each group of researchers and reveals differences in their collaborating objects. Since the top five countries differed in the two groups of migrant researchers, this study listed all of the researchers and associated them with the number of international co-authored papers, resulting in more than five countries.

Figure 4 indicates that the United States was the primary collaborating partner for Japan, South Korea, and Taiwan, whereas Hong Kong was the key collaborating partner for researchers in China, followed by the United States. This finding was in contrast with those of previous studies, which identified the United States and Japan as China's main collaborative partners (Niu & Qiu, 2014; Royle et al., 2007; Wang et al., 2013). As with the sample definition in this study, Royle et al. (2007) considered Hong Kong as an international co-author, Wang et al. (2013) explicitly treated Hong

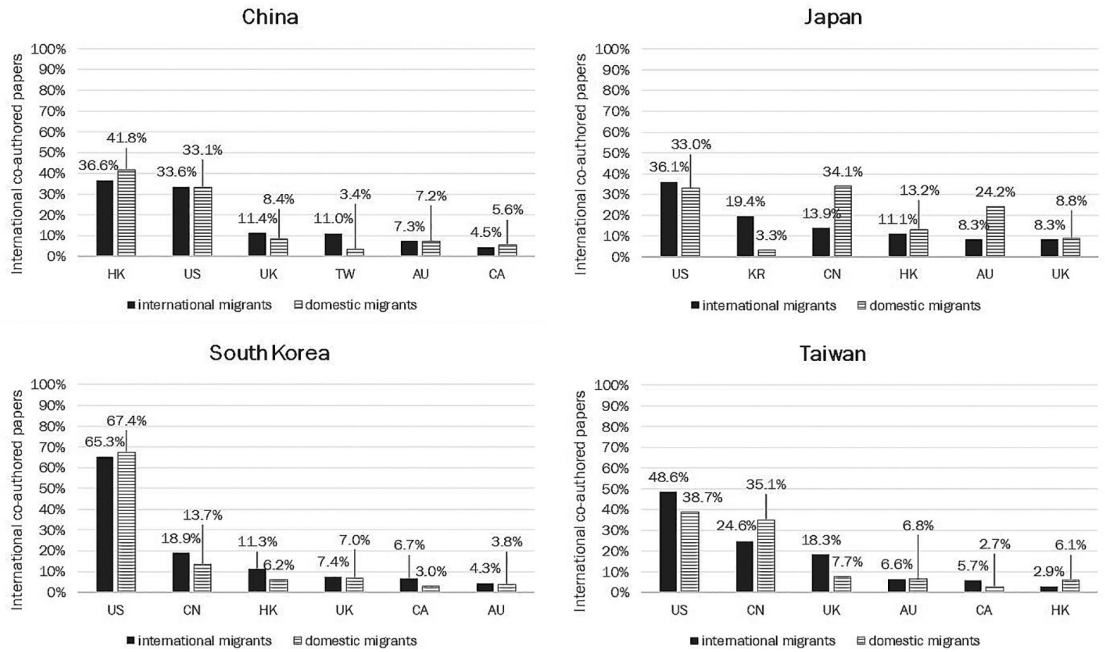
Table 4. International Collaboration of Migrant Researchers in CJKT

Country	International migrants			Domestic migrants		
	ICP	ICR (%)	NCC	ICP	ICR (%)	NCC
China	1,365	55.3	52	1,257	42.8	50
South Korea	806	45.1	48	497	34.4	28
Taiwan	350	31.5	39	413	17.6	31
Japan	36	26.7	11	91	20.6	19
Total	2,557	46.4	63	2,258	31.5	62

Note. ICP is international co-authored papers, ICR is the international collaboration rate, NCC is the number of countries involved in collaboration. Order of the countries is based on the ICP of international migrants. Total number of countries involved in collaboration is the number after de-duplication.

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Figure 4. Top Five Countries Collaborating with Migrant Researchers in CJKT



Note. Order of countries is based on the proportion of co-authored papers by international migrants in each country.

Kong and Macau as non-Chinese subjects, and Niu and Qiu (2014) analyzed authors affiliated with the People's Republic of China. This study inferred that Hong Kong's higher English writing skills, favorable global economic and trade environment, and geographical and linguistic proximity to China motivated Chinese researchers to collaborate with Hong Kong. Notably, Taiwan, Japan, and South Korea had a certain proportion of collaboration with Hong Kong, indicating its crucial role in the business and management field.

Moreover, this study found that Japan, South Korea, and Taiwan had collaborative relations with China, but the proportion of collaboration varied between international and domestic migrants. Domestic migrants in Japan and Taiwan had a higher proportion of collaboration with China, while their international migrants preferred to collaborate with such countries as South Korea. As for Japan, the country's domestic migrants had a collaboration rate of 34.1% with China, while that of the international migrants was only 13.9%. This meant that domestic migrants in Japan were more likely to collaborate with China, whereas its international migrants preferred collaborating with such countries as South Korea. This finding highlighted the importance of considering the characteristics of migrant researchers when examining international collaboration.

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4.3 Migration moves of migrant researchers

The data showed that international migrants moved a total of 741 times with an average of 2 moves per capita, while domestic migrants moved a total of 833 times with an average of 1.5 moves per capita. This confirmed H3, that is, international migrants moved more frequently. Inter-university migration accounted for more than 90% of institutional changes for both international (93.3%) and domestic (93.4%) migrants, and less than 5% moves were to non-universities. In summary, both groups mainly migrated between universities, with no moves between non-universities observed for international migrants.

Table 5 illustrates the proportion of migrant researchers' switching among institutions. The vast majority of institutional changes for both international and domestic migrants were migrations between universities, and less than 5% moves were to non-universities. Notably, migrant researchers in Taiwan showed the highest number of migration moves (2.9 times per capita for international migrants and 1.8 times per capita for domestic migrants), followed by South Korea, Japan, and China.

The proportion of inter-university migration was less than 90% in Japan and South Korea (78.3% for international migrants in Japan and 82.3% for domestic migrants in South Korea). The large variation can be attributed to the small sample size for Japan. Notably, Joon-ho Kim was the only domestic migrant in South Korea who moved from a non-university to another non-university and then to a university. More specifically, he moved from Garam Education (Note 1) to Golden CATs (Note 2) and then to Sejong University. In sum, inter-university migration was the main migration trend for both international and domestic migrants, with only a small proportion of moves taking place across institutional types.

5. Discussion and Conclusion

For long, scientific migration has been considered crucial for a country's scientific research development. This study is one of the

Table 5. Proportion of Researchers' Migration Moves among Different Institutional Types in CJKT

Institution type changes	International migrants (%)					Domestic migrants (%)				
	China	Japan	South Korea	Taiwan	Total	China	Japan	South Korea	Taiwan	Total
Uni→Uni	95.8	78.3	92.0	91.7	93.3	96.9	96.0	82.3	95.6	93.4
Uni→Non-Uni	1.8	8.7	4.2	4.1	3.2	1.4	0.0	5.1	1.6	2.2
Non-Uni→Uni	2.4	13.0	3.8	4.1	3.5	1.7	4.0	12.0	2.9	4.3
Non-Uni→Non-Uni	0	0	0	0	0	0	0	0.6	0	0.1
Moves per capita	1.7	1.8	2.2	2.9	2.0	1.3	1.4	1.5	1.8	1.5

Note. Uni→Uni is migration between universities, Uni→Non-Uni represents migration from university to non-university, Non-Uni→Uni denotes migration from non-university to university, Non-Uni→Non-Uni represents migration between non-universities.

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few in Taiwan to analyze the scientific migration of both international and domestic migrants using a large dataset of bibliographic records. The study analyzed the research performance, international collaboration, and migration moves of 929 migrant researchers in the business and management field in China, Japan, South Korea, and Taiwan. This section briefly summarizes the key findings and recommendations for future research.

In terms of research performance, the results did not support H1.1 because the overall RPR of domestic migrants in China and Japan were higher than that of international migrants. In South Korea and Taiwan, although the number of published papers was higher for international migrants than for domestic migrants, there was no significant difference between the two. International migrants in China, South Korea, and Taiwan attracted more citations compared with domestic migrants. However, the performance of migrant researchers in Japan differed. The country's CPP of domestic migrants was higher than that of international migrants. Therefore, the findings did not support H1.2.

In terms of international collaboration, international migrants exhibited a higher international collaboration rate (46.4%) compared with domestic migrants (31.5%). This finding supported H2 and previous research that suggested that researchers with international backgrounds or overseas experiences tended to have a larger international collaborative network (Jonkers, 2010; Scellato et al., 2015). Nevertheless, domestic migrants collaborated with a total of 62 countries, which is nearly comparable to the number of countries with which international migrants collaborated. This implied that domestic migrants possessed a "broad" international collaborative network but required further enhancement in terms of its "depth." International migrants preferred to collaborate with Western countries, such as the United States, the United Kingdom, and Canada, while domestic migrants tended to collaborate with Asia-Pacific countries, such as China, Hong Kong, and Australia. In addition, migrant researchers in Japan, South Korea, and Taiwan tended to collaborate with the United States, whereas those in China mainly collaborated with Hong Kong, followed by the United States.

To the effect of migration moves, international migrants tended to move more frequently compared with domestic migrants, thus supporting H3. Both groups primarily showed migration between universities. The average number of migrant researchers' moves ranged from 1.5 to 2, which is consistent with Barbezat and Hughes' (2001) finding that academic faculty moved less than three times on average. Notably, Taiwan's researchers demonstrated the highest frequency of migration moves, indicating a greater tendency to switch institutions.

This study is subject to several limitations. The most crucial is the representativeness of the sample. First, given the limitations of the database and the focus on researchers from the business and management field, the bibliometric results can only be analyzed using the collected records. Therefore, the number of migrant researchers and the overall research performance, international collaboration, and movement may not accurately reflect the behaviors of researchers from all fields and countries. Second, this study used the Scopus author ID to match bibliographic data in the WoS database. While the validity and reliability of

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the Scopus author ID as a disambiguation tool for cross-database names need to be continually validated in follow-up research, the results of this study suggested that the method is effective in connecting authors and paper information across different databases (Aman, 2018; Kawashima & Tomizawa, 2015). Although bibliographic data from a single database are useful, they are not comprehensive enough for further research. Therefore, to construct a more detailed scientific migration trajectory, it is recommended to use API integration techniques to obtain a large amount of open-access bibliographic data, such as those available from Crossref. This will facilitate the construction of a more detailed scientific migration trajectory for migrant researchers and produce a more comprehensive understanding of scientific migration.

The present research revealed certain descriptive outcomes, but there remained many issues worth exploring. For example, it may be interesting to investigate the relationship between citation counts and scientific migration and observe if this relationship affects the quality of papers. In addition, it would also be insightful to explore if migration affects the international and domestic collaboration of researchers and which countries and institutions are considered attractive. This study mainly focused on differences in research performance (paper publications and citations), international collaboration, and movement between migrant researchers with and without overseas experiences. As a result, it excluded non-migrants. "Non-migrants" represent researchers who have not changed institutions since their graduation and, therefore, are assumed to be self-hired by their alma mater. Examining the phenomenon of self-hiring could help examine "academic inbreeding" in the academic market. It is also possible to analyze differences in the research collaboration between migrant and non-migrant researchers. This study could not observe self-hiring by the alma mater owing to the limitations of using bibliographic records. Future research should explore institutions from which researchers obtained their doctoral degrees to enable more diverse analyses.

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Notes

Note 1 Garam Education is a private educational institution in South Korea which mainly provides nursing and business skills courses needed in the face of an aging society. http://www.garamedu.co.kr/

Note 2 Golden CATs is a private educational institution in South Korea which mainly provides education courses in culture and art, including dance, Korean traditional culture education, etc. https://www.goldencats.co.kr/

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臺中日韓商管領域學者之研究表現、研究合作及遷移情形：國際遷移者與國內遷移者的比較分析

Research Performance, Collaboration, and Movement of Researchers in the Field of Business and Management: A Comparison between International and Domestic Migrants in East Asia

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摘　要

本研究以遷移至臺灣、中國、日本、南韓之929位商管領域學者為研究對象，針對國際遷移及國內遷移等兩種遷移類型學者，分別比較兩者在發表文章特性、合著特性與遷移情形上的差異。研究結果顯示，四國之國際與國內遷移者的論文生產力相近，論文影響力則以臺灣學者發表文章的平均被引次數最多，可知臺灣無論國際或國內遷移者，發表文章皆有一定水準。國際合作部分，研究發現臺灣、日本及南韓以美國為首要合作對象，中國則與香港合作較為緊密。遷移情形分析結果顯示，四國之國際遷移者的平均遷移率高於國內遷移者，平均每人遷移2次。綜合而言，本研究是少數以大量書目資料同時分析國際遷移與國內遷移，研究結果可用來觀察東亞國家整體的科學遷移表現。

關鍵字：學術移動、國際遷移者、國內遷移者、書目計量、商管領域

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