Labor Segmentation and the Outmigration Intention of Highly Skilled Foreign Workers:
Evidence from Asian-born foreign workers in Japan

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Abstract

This study examines the determinants of the outmigration intentions of highly skilled foreign workers, i.e., workers who received post-secondary education, following conventional migration theories. Data come from a survey of firms and their foreign employees in Japan; most of whom were born in Asia, especially in China (77.4% of total observations). The results found that education level and average wage gaps did not significantly affect the outmigration decisions of Asian-born workers. However, the labor segmentation variable, which represents the firm's differentiation between foreign and native workers, has a significant estimated effect. Results indicate that Asian-born employees of firms that differentiate between foreigners and native workers are more likely to migrate away from Japan. The explanation could be that labor segmentation reduces foreign workers' expected future wage. Furthermore, the lifetime employment system in Japan could reduce the outmigration of Asian-born foreign workers, because the reduced future unemployment risk increases workers' expected wage from working in Japan. Moreover, a higher current job satisfaction could have a negative effect on Asian-born foreign workers' outmigration intention. Finally, among the control variables for the original migration motivations, Asian-born foreign workers who were motivated by the Japanese lifestyle tend to remain in Japan, while Asian-born foreign workers who were motived by wages are more likely to migrate away in the future.

Keywords: Asian-born foreign workers, Outmigration, Education, Average wage gap, Labor segmentation, Lifetime employment, Job satisfaction

JEL: J61, J71, J28

1. Introduction

Outmigration of foreigners have received much attention in theoretical and empirical works in many countries, but few studies have focused on Japan. While being the world's third largest economy, Japan has had a very small number of foreign workers for decades. Japanese firms and government have mostly considered foreign workers as complementary to Japanese labors, to avoid substitution and unemployment. In recent years, driven by the increasing importance of highly skilled foreigners, the Japanese government has focused on attracting highly skilled foreign labors, by encouraging foreign graduates from Japanese universities to work in Japan, and by providing immigration benefits to foreign professionals (Immigration Bureau of Japan). The retention of foreign skilled workers has been a significant concern for the Japanese government and firms.

Conventional neoclassical economics consider that labors migrate from wealthy to less wealthy regions (e.g., Todaro 1969; Harris and Todaro 1970); both supportive and conflicting facts have been found. Borjas and Bratsberg (1994) developed an outmigration model, considering that the expected wages of migrants are determined not only by the regional average wage level, but also by the returns on migrant skills. Therefore, it is possible that a worker moves back to a less developed country if he/she would receive a higher return on their skills in those countries. Outmigration could be caused by failed perceptions of wages in the host countries. On the other hand, outmigration could be part of lifetime planning, which is based on the perception that migration experiences could increase wages for workers when they return to their home countries, compared to those who do not migrate.

Previous empirical studies have found that foreigners' outmigration decisions are affected by their education, age, length of stay in the host country, life satisfaction, and others (Steiner and Velling's 1994, Jensen and Pedersen 2007, Van Hook and Zhang 2011, Makina 2012). Few studies paid attention to factors related to their workplaces, perhaps because of lack of data. However, for employed foreigners, host country workplace factors—especially discrimination and potential opportunities—could affect their expected utilities and thus lead to different outmigration intention levels. As a result, this study examines the effects of both personal and firm factors on the outmigration intentions of foreign workers in Japan, over 90% of whom were born in Asian countries especially China. Especially, it pays significant attention to labor segmentation between foreign and native workers, which widely exists in Japan.

In Japan, international graduates from Japanese universities or colleges represent the most important source of highly skilled foreign labor. As a non-English speaking country, most Japanese firms require a business level of Japanese, which is difficult to attain for most foreigners who come to Japan for a short time. As a result, many firms hire foreign highly

skilled labors from international students who graduated in Japan. The Japanese government has been encouraging foreign students to study in Japan, and retain them after graduation (METI 2015). Therefore, this study concentrates on highly skilled foreign labors who received post-secondary education in Japan.

The human capital of highly skilled foreign labors in this study include both general skills obtained from majors in universities and colleges, and foreigner-specific skills such as native-level foreign languages, familiarity with overseas affairs, and smooth international communication[2]. Thus, when employing a foreign worker, a firm could make use of his/her general skills, similar to local workers, or could concentrate on their foreigner-specific skills, or both. Labor segmentation of foreign and local workers occurs in firms who completely concentrate on foreigner-specific skills and treat foreign labors as complementary to local workers. This practice exists widely in Japan, for fear of substituting Japanese labor and causing unemployment. Even in the recent policy that aims to attract highly skilled foreign workers, named the Points-based System for Highly Skilled Foreign Professionals, the first concept is "the quality, unsubstitutable human resources who have a complementary relationship with domestic capital and labor" (Immigration Bureau of Japan).

It has not been clear whether this labor segmentation benefits or penalizes foreigners. On the one hand, as a result of globalization, foreigner-specific skills such as native-level foreign language are important for firms and could be highly valued and rewarded. However, if the current labor supply exceeds demand in the segmented labor market of foreigners in Japan, foreigner-specific skills may lead to low wages. Furthermore, labor segmentation could lead to different levels of investment in human capital by firms, and cause separated foreign and local labor career paths. Especially in the Japanese employment system, firms invest heavily in workers' human capital, and develop their skills by experiencing various types of jobs. Those chances would be lost for foreign workers who are separated from local labors and, therefore, probably reduce their lifetime expected utilities.

Moreover, expected wage is not only determined by the wage level, but also by the possibility to obtain the expected wage (Todaro 1969). Employed workers may experience unemployment spans during their career. However, the unemployment risks are much lower in Japan if workers acquire lifetime employment—*seishain* in Japanese. Most *seishain* workers are hired as new graduates. They are granted lifetime employment, and firms are not able to fire a *seishain* worker, even if the job becomes profitless. The rate of seishain workers reduced

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[2] Note that foreigner-specific skills is defined differently from firm-specific skills in literature. For instance, foreigner-specific skills, such as native-level foreign language, are easy to be applied to other firms, while firm-specific skills are not.

since the 1990s, while in 2008, the sample year of this study, 65.9% of the total Japanese employment comprised *seishain* workers (MHLW).

Finally, because migration behavior is of mixed content (Cassarino2004), non-economic factors are included as control variables in this study. The first is the initial motivation to migrate. Living in Japan may offer a convenient lifestyle, limited air pollution, and good democracy, perhaps better than the related social and institutional factors in some of the foreigners' home countries. Advanced technology and famous companies may also be attractive to some foreigners. Further, factors related to personal and firm characteristics are also controlled.

Many empirical studies on outmigration addressed migration intentions, instead of actual migration behaviors (Dustmann 1993, Steiner and Velling's 1994, Waldorf 1995, Haug 2008, De Haas and Fokkema 2011). As a proximate determinant of migration behavior (De Jone 2000), migration intentions represent the optimal decisions of migrants, which are based on their perceptions of income, labor market situations, utilities from cultures, social factors, and others. Actual migration behaviors result from prior migration intentions, while they are also affected by exogenous shocks of economies and labor markets, and unexpected personal affairs. Further, detailed individual data of actual migration behavior are usually unavailable.

This study examines migration intentions. It provides empirical evidence of the determinants of the outmigration intention of highly skilled foreign workers in Japan, that is, foreign workers who received postsecondary education in Japan, over 90% of whom are from Asian countries. It specifically examines the effect of labor segmentation between foreign and native workers, which has not been clear in literature.

This document is structured as follows. Section 2 provides a background and literature review. Section 3 describes the estimation strategy, and data are explained in Section 4. Section 5 discusses the estimation results, and Section 6 concludes.

2. Background and literature review

2.1 Theoretical approaches

Three major theoretical approaches have been used to address return migration issues (Cassarino2004, Makina 2012). The first is the neoclassical economic theory of migration (NE) (Todaro 1969, Borjas and Bratsberg 1994), which considers the reason for return migration as the lower utilities or wages in host countries than in home countries. The second, the new economics of labor migration theory (NELM) (Stark 1991), paid attention to migrants who have families (e.g., spouses or children) living in home countries. Their initial motivation for migration is remittances and savings, and they return to their home countries

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when meeting their goals such as higher household income or accumulation of savings (Stark 1991, Cassarino2004). Furthermore, the structural approach, developed by "anthropologists, sociologists, and social geographers," argues that "return is not solely analyzed with reference to the individual experience of the migrant, but also with reference to the social and institutional factors in countries of origin"(Cassarino 2004).

This study applies the first theoretical approach, the neoclassical economic theory of migration (NE), while taking into account some factors indicated by other theories. Because the object group of this study is foreign workers who graduated from Japanese universities or colleges, the probability of the initial motivation for migration for remittances is small. However, there could be factors other than the expected wage that affect migration. For instance, living in Japan may afford a convenient lifestyle, limited air pollution, and good democracy, perhaps better than the related social and institutional factors in some countries of origin.

2.2 Labor segmentation

In Japan, labor segmentation of foreign- and locally skilled workers have long existed widely in firms. For fear of affecting the job opportunities of local workers, foreign workers were considered as having a complementary role. That is, foreign workers should do jobs that local workers do not do or are not able to do. Different from many developed countries that employ foreign talents for R&D and innovation (OECD 2008), most enterprises in Japan employ foreign labors for foreign languages and overseas marketing. A survey by JETRO ranked the merits that Japanese firms consider when hiring foreign workers. The top three merits were market expansion, smooth international communication, and foreign language improvement; only 14.5% of Japanese firms considered foreign labors as contributing to new product development, and only 11.9% of firms considered foreign labors as assisting with problem solving. The latter two items were the lowest ranked (JETRO 2017).

Jobs that require native-level foreign languages and foreign skills could benefit foreign workers, because they cannot be substituted by local Japanese workers. On the other hand, those jobs could limit the career opportunities of foreign workers. In Japanese firms, workers who were trained through exposure to various kinds of jobs in the firm, and even through transfer to many places in the country (*sogoshoku* in Japanese, Sato and Sano 2005), are promoted into managerial ranks. Foreign workers who are hired for foreign languages or overseas marketing are usually separated from those career paths, and thus have few expectations for promotion. Holbrow and Nagayoshi (2016) examined the effects of separate career paths on the wage of foreign workers. They found that different career tracking for foreign employees, such as overseas executives and overseas business specialists, have

significantly *negative* effects on foreigners' wages, treating those who consider the same career tracking with Japanese as the reference group. Furthermore, labor segmentation between local and foreign highly skilled labors is probably accompanied by discrimination. Gong (2017), based on two sets of survey data from Japan, showed that skilled immigrants are more likely to be negatively affected by discrimination than are unskilled immigrants. That study explains the phenomenon by comparing immigrants' discrimination experiences prior to migration.

It has not been clear whether or not labor segmentation affects the migration intention of foreign workers. On the one hand, the native-level foreign language skills and foreign marketing knowledge may be valued more highly in Japan than in foreigners' original countries, because those skills cannot be substituted by local workers in Japan. However, under the Japanese promotion system, labor segmentation from local workers may reduce foreign workers' future career expectations. As a result, one of the key purposes of this study is to examine the effect of labor segmentation on the migration intention of Asian- born foreign workers.

2.3 Empirical evidence

Empirical evidence of foreigner outmigration have been provided in many countries and attracted much attention, while little attention has been paid to firms' roles and migrants' working environments. For instance, a German study of Steiner and Velling's (1994) found that the intended stay of foreigners is affected by age, nationality, education, property, family context, years since migration, the ability to speak German, and the subjective feeling of well-being associated with staying in Germany. In Denmark, Jensen and Pedersen (2007) showed that decisions to return depend on country of origin, age at entry, education level, and family ties. In the U.S., Van Hook and Zhang (2011) found that emigration is determined by indicators of economic integration (home ownership, school enrollment, poverty) and social ties to the U.S. (citizenship, having young children, duration in the United States). A South African study (Makina 2012) identified six factors that significantly determine return migration intentions: reason for migrating, dependents supported in the home country, education, economic activity in the host country, income, and duration of stay in the host country.

In Japan, there have been few studies on the migration decisions of workers[3], while the

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[3] An exception is Yamaguchi and Maeda (2015), who examined whether firms' strategies of human resource management are effective on workers' intentions "to settle and work in Japan," such as "Improve Japanese employees' understanding of other cultures," while the issue of labor segmentation or discrimination was not addressed in the literature. Further, the estimation process was questionable. For

outmigration of foreign students have been examined in some studies. Shiho (2015) carefully examined the determinants of the stay rates of foreign students during 2007–2012, and used macro data of Japan and countries of origin to find that "the deepening economic relationship between the origin country and Japan tends to turn down the stay rate while the economic growth of the origin country and the better Japanese labor market condition turn up the rate." Liu (2016) examined the return migration intentions of foreign students in the Kansai region of Japan, and the results indicate that culture contributed significantly to students' migration decisions, while low levels of Japanese language proficiency could be a barrier to the retention of foreign students.

This study is designed to examine the determinants of the migration intention of Asian- born foreign workers in Japan. Further, it pays special attention to the role of within-firm labor migration, which has not been clear in earlier literature.

3. Estimation strategy

The estimation strategy of this study is based on the neoclassical economic theory of migration (NE). Further, it considers initial motivations for migrant, employment environment, and workers' and firms' characteristics, which are indicated by other theories of outmigration.

Theoretical variables indicated by a model of NE

The study constructs a theoretical model based on neoclassical economic theory of migration (see Appendix A). In the model, the return migration decision is determined by the local average wage level, skills of the worker, returns on skills, and the probability to be employed.

First, the theoretical probability to leave Japan could be decreased by a higher average wage and a higher probability of employment in Japan. Further, if the general human capital of education is valued more highly in Japan than in other counties, a higher level of education could reduce the intention to leave Japan. On the contrary, it is possible that education is not valued more highly in Japan, or even valued lower in Japan than in other countries, respectively.

Similarly, foreign specific skill, such as native-level foreign language and familiarity with the foreign market, has the possibility of being valued high or low in Japan. On the one hand, foreign specific skills are not substitutable by local Japanese labors; therefore, it may be highly valued by Japanese firms. However, on the other hand, it may lead to lower wages if the labor

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instance, to obtain major estimates, the study included both "fulfilled" and "not fulfilled" in one estimation equation (Yamaguchi and Maeda 2015, Page 13).

supply of foreigners exceeds labor demand in the segmented labor market of foreign and local labors in Japan. Further, labor segmentation between foreign and native labors sometimes limits the career opportunities of foreign workers, which reduces their expected wages. Especially in Japan, firms evaluate and develop workers' abilities by experiencing various types of jobs, while those chances are rare for foreign workers who are hired for their foreign specific skills. Finally, a higher probability to be employed in Japan could also reduce the return intention.

Initial motivations for migrants

The theoretical model concentrates on wage, but it is noticed that there could be multiple reasons that initially motivate foreign workers to work in Japan. One major motivation could be the Japanese lifestyle. As noted earlier, this includes a convenient lifestyle, limited air pollution, and good democracy, as well as advanced technology and famous companies. The study identified four categories of motivations: high wages, Japanese lifestyle, advanced technology and famous companies, and other motivations such as interest in the job content.

Employment environment

Except for the expected wages that were discussed in the theoretical model, traditional employment practices in host countries could affect the migration intention of foreign workers. A unique seniority-based employment system exists widely in Japanese firms, which may disappoint young foreign workers. Further, overtime work and a low level of work-life balance are also considered barriers to the attraction of highly skilled foreigners (Törngren and Holbrow 2017). On the other hand, Holbrow and Nagayoshi (2016) found that a merit-based employment system could reduce the wages of foreign workers with longer work histories in Japan. Further, less overtime work than other workers could reduce promotional opportunities in Japanese firms. Therefore, factors of employment practices, including overtime work frequency, merit-based evaluation, and early selection for promotion, are introduced while their effects on the migration intention of foreigners are expected to be ambiguous.

A comprehensive factor, job satisfaction, may reflect workers' opinions on the entire employment system and working conditions in Japan. Thus, the study further introduced the variable of current job satisfaction and examined its effect on foreign workers' migration intention.

Personal characteristics

Personal characteristics such as age, marriage, and language could affect foreign workers' integration into the host country. For instance, a worker who speaks better Japanese, or who

marries a Japanese person, may be easier to integrate into Japanese society and may enjoy higher utility in Japan. Further, the integration may differ between males and females, and young and old workers. Past experience in Japan may also contribute to integration.

Firms' characteristics and behaviors

Foreign workers' migration intention could differ among different types of firms. Thus, this study controls for the characteristics and behaviors of the firms where foreign workers are employed, including firm size, foreign managers, share of foreign capital, and overseas activities.

4. Data

This study used data from a 2008 survey of firms and their foreign employees in Japan that was conducted by the Japan Institute for Labor Policy and Training(JILPT). The survey collected general information about the firms and their foreign workers, as well as foreign workers' opinions on working in Japan and firms' opinions on employing foreigners. In particular, the questionnaire included foreign workers' plans to stay in Japan, their education and working environment, and firms' human resource strategies, which provide the key data for the study.

The population of firms surveyed includes all firms with over 300 employees in Japan, which are obtained from the corporate information database of Teikoku Databank; some industries, such as agriculture and forestry, are excluded[4]. The population of workers includes foreign employees who worked in those firms that previously graduated from Japanese universities or colleges, and were working as *seishain*, or full-time workers who were hired by the employer in the survey year on a fixed-term contract. A total of 3,018 firms completed the survey (29.2% of a total of 10,349 firms), of which 1,120 employ foreign workers. 902 responses from foreign employees in those firms were gathered (JILPT 2009); over 90% of the respondents were Asian-born workers (see Table 1.1).

Data of both return- migration and outmigration intentions are obtained from the data of the survey. The return migration intention was represented by those who answered that they would like to go back to home countries in future (Return=1, Stay=0). Further, in the data of the outmigration intention, 1 refers to those who intended to go back to their home countries as well as those who intended to go to other countries outside Japan and home countries, while 0 refers to those who intended to stay in Japan.

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[4] The following industries were excluded from the survey: agriculture and forestry, fisheries, education, compound services, political, businesses and cultural organizations, religious institutions, foreign public services, and government services.

Among the independent variables, education is measured by the highest level of Asian-born workers' education, wherein 5 denotes a Ph.D. degree (11.3% of total sample); 4 denotes a master's degree (43.2%); 3 denotes a bachelor's degree (41.3%); 2 denotes graduation from a two-year junior college (1.1%); and 1 denotes graduation from a specialized vocational high school (3.1%). Data of labor segmentation originated from the question to firms for the multiple reasons of hiring Asian-born foreign workers: (1) do not differentiate between foreign and native workers; (2) demand for foreign language, foreign knowledge and ideas, or globalization; (3) lack of highly skilled natives, or low cost of foreign labors. Those who did not choose the first reason are considered firms with significant labor segmentation, denoted by 1, and others by 0. Furthermore, the proxy for the probability of being employed in future is whether the worker is employed as a *seishain* (*seishain*=1, non-*seishain*=0). *Seishain* represents a unique employment system in Japan. Most *seishain* workers are hired as new graduates, and are granted lifetime employment. It is difficult for a firm to fire a *seishain* worker, even when the job becomes profitless. Thus, foreigners who obtain *seishain* employment in Japan indicate a higher probability to be employed in future than moving to other countries. Non-*seishain* workers in the data are *keiyaku-shain*, who are hired on a fixed-term contract with the employer, while part-time workers are not included in the survey.

Job satisfaction data were derived from the following question to Asian-born workers: "Are you satisfied with the current job?" Answers include "very satisfied" (denoted by 4); "satisfied" (denoted by 3); "not satisfied" (denoted by 2); and "not satisfied at all" (denoted by 1). Language proficiency includes "native level" (denoted by 6); "very good at reading and writing in Japanese (N1 of Japanese Language Proficiency Test, JLPT)" (denoted by 5); "able to read and write in Japanese (N2-3 of JIPT)" (denoted by 4); "not able to read and write, while can speak in Japanese" (denoted by 3); "not able to read and write, while can speak a little Japanese" (denoted by 2); and "know little about Japanese" (denoted by 1). Data of *overtime work frequency* are from workers' responses to the question: "how often do you work overtime in your company?"—which are "very often" (denoted by 3); "sometimes" (denoted by 2); and "seldom" (denoted by 1). Further, data of employment practices, including "merit-based evaluation"; "early selection in promotion"; and "work life balance" are from the question to firms: "Do you think it correctly describes your employment practices?". The responses include "definitely yes" (denoted by 4); "rather yes (than no)" (denoted by 3); "rather no (than yes)" (denoted by 2); and "definitely no" (denoted by 1), for each of the three employment practices. Moreover, data of firm size were measured by employee numbers, including "fewer than 300 workers" (denoted by 1); "300 to 499 workers" (denoted by 2); "500–999 workers" (denoted by 3); and "more than 999 workers" (denoted by 1). Finally, GNP per capita was used as proxy for the average wage level of Japan and other countries,

from database of World Bank Open Data (WBOD).

Descriptive statistics are reported in Table 1.2.

5. Results and discussion

Two models were estimated in this study. The one is the return migration model, which follows our theoretical model exactly (see Appendix), while the other is the outmigration model, which assumes that foreign workers are allowed to migrate to any countries outside Japan during their lifetime, and are not limited to the home country.

Among them, the return migration model includes the independent variable of wage gap between Japan and the home country, while the outmigration model does not. Further, foreign workers whose first destination of outmigration is not the home country are excluded from the return migration model. Moreover, for the return model, information about the country/region of origin is available for 88.9% of worker samples (i.e., for workers from China, Korea, and Taiwan); thus, the return migration model is limited to foreign workers who were born in those three countries/regions, while the outmigration model includes the entire sample.

Labor segmentation

First, it is shown that the estimates of labor segmentation are significantly positive in all estimated models. Firms' labor segmentation between foreign and local labors could increase the possibility of outmigration of Asian- born foreign workers to migrate from Japan. The explanations are as follows. First, based on the theoretical model, foreigner-specific skills such as foreign language and overseas knowledge may not be valued more highly in Japan than in other countries. Even while those skills are necessary for Japanese firms to improve their competitiveness in international markets, they do not contribute to the expected income of foreigners. The demand for foreigner-specific skills may be lower than their labor supply in the segmented labor market. Indeed, a survey reported that the human resource strategy for expanding overseas business of 73% of Japanese firms considered development of Japanese workers' international skills or hiring skilled Japanese workers as the most important, while only 23% of firms considered employing foreigners as the most important (JETRO 2017). On the other hand, labor segmentation could lead to discrimination against foreign workers by limiting their opportunities for job training and promotion. As discussed in the Introduction, Japanese firms invest heavily in workers' firm-specific human capital by exposing them to different types of jobs in the firm, while those opportunities are few for foreign workers who are hired for their foreigner-specific skills.

Education

The estimate of education is not significant, perhaps because a higher level of education does not contribute to higher income expectations in Japan, compared to their home countries. Indeed, many Japanese firms may not consider a PhD degree as better than three years of work experience, while facts indicate that PhD degrees are highly valued by many Chinese firms and government. For instance, some Chinese local governments provide subsidies and benefits for PhD holders during the startup of their businesses (Net Ease, 2015), while those policies are not seen in Japan. In addition, a foreign worker with a higher level of education may sometimes secure a job easier in a different country; however, some countries also observe that foreign workers with a higher level of education are more likely to stay than leave(e.g. Steiner and Velling 1994).

Wage gap

Considering other variables of the theoretical model, the estimate of the average wage gap is not significant. This could be attributable to two reasons. First, because the economic growth rates observed during the survey are higher for the three sample countries/regions than for Japan (China 14.25%, Korea 5.5%, while Japan 1.7% in 2007, annual GDP growth rate, sourced from WBOD; Taiwan 6.5% in 2007, sourced from NSRC), samples of foreign workers may expect a smaller wage gap in future. Second, low average wages in home countries could play a very minor role in the determinants of their expected income, compared to return on skills. Especially, working experiences in Japan could be highly valued in their home countries, thus they could receive much higher than average wages when they return to their home countries.

Seishan employment

The last variable of the model, employment as *seishain* workers, has significantly negative estimates in both return migration and outmigration models. It is indicated that Asian- born foreign workers who acquired lifetime employment could have a lower probability to migrate out of Japan, perhaps since their probability of unemployment is lower than when migrating to other countries. While there are also probabilities that career opportunities are fewer for non-*seishain* than *seishain* workers in a particular firm, those effects on the migration decision could be very small after controlling for job content, education level, years of experience in Japan, and labor segmentation in the estimation.

Initial migration motivation: wages

Further, among control variable groups, the initial migration motivation of a higher wage

in Japan has a very significant positive estimate, which indicates that Asian- born migrant workers who expected a high income in Japan initially could have a higher probability to return to their home countries or migrate to other countries. On the one hand, it could be explained by the neoclassical economic theory on return migration, which considers return/outmigration as a "failure" of wage expectations in host countries. On the other hand, taking into account the new economics of return migration, it is possible for some of the migrant workers that it was a "success" in terms of expectations, in cases where their families live in home countries and they work in Japan to accumulate savings for better lives or business startups in their home countries, and return when the goals have been achieved successfully. Further, the above explanations could be mixed in cases where migrant workers come to Japan for a period of work and then decide whether to let their family migrate to Japan, or to return to their home countries. Above all, in any explanation, the initial migration motivation of a higher wage leads to a higher level of out-migration.

Initial migration motivation: lifestyle

Contrary to the wage motivation, the motivation of a Japanese lifestyle has a very significant negative estimate, in both estimations of return migration and outmigration, which indicates that migrants who have initial motivations of living in Japan tend to remain in the country. It could be a simple "success" of migrant expectations, in which they found the Japanese lifestyle as good as they expected. Indeed, many foreigners find reduced crime, limited air pollution and a convenient lifestyle as expected or even better, after a period of living in Japan. When they realize that the Japanese lifestyle is as expected, the possibility exists that they may bring their families from abroad to come to live in Japan.

Initial migration motivation: Japanese jobs

The initial motivation of Japanese jobs—including that the workers were attracted by job content, high-level technology, good brand image, and stability of Japanese firms—has an insignificant estimate. The reason could be that this initial motivation contributes to both staying in Japan and moving abroad: on the one hand, an interest in Japanese firms and jobs increases the utility of working in Japan; however, the experience of working in Japan may be highly valued abroad and increase expected wages in other countries. Therefore, the migration decision is ambiguous for Asian- born workers who were initially motivated by Japanese jobs.

Job satisfaction

Even though most estimates on variables of employment practices are insignificant, the current job satisfaction of Asian- born workers has a significant negative estimate. Results

indicate that workers who have a higher level of job satisfaction in their current job tend to remain in Japan, because the current utility obtained from working in Japan affects their future expectations. Further, job satisfaction is determined by factors such as working hours and firms' employment systems, but those factors do not significantly contribute to migration decisions. The explanation could be that the effects of working hours and firms' employment systems may have ambiguous effects on the migration decision. For instance, longer working hours reduce the leisure time of a worker; however, it also suggests a higher valuation of the workers' skill and ability, and thus leads to a higher level of expectation on career development. In addition, a merit-based employment system may benefit some of the foreign workers; however, it has the probability of reducing foreign workers' wages (Holbrow and Nagayoshi. 2016). As a result, instead of the separated factors of working hours and employment system, job satisfaction is a comprehensive consideration in employment and working conditions, and thus has a significant effect on migration decisions.

Worker and firm characteristics

Finally, among variables of the characteristics of Asian- born workers and firms, a longer period of past stay in Japan and marrying Japanese could reduce the return-migration intention, because of a higher level of integration into the Japanese society. Those effects become almost insignificant when including the migration intention to countries outside Japan and the home country, perhaps because the experiences on integrating into the Japanese society helps integration into other foreign countries. Further, the study does not find significant effects of firm size, foreign managers, foreign firms, and overseas activities on the migration intentions of Asian- born foreign workers.

6. Conclusion

This study examined the determinants of the outmigration intentions of skilled foreign workers in Japan, most of whom were born in Asian countries especially China. The estimation result did not find significant effects of the education level and average wage gap on outmigration decisions. However, the variable of labor segmentation, which indicates whether the firm differentiates foreign workers from native labors, has a significant estimate. It is indicated that Asian- born foreign workers who work in labor-segmenting firms are more likely to outmigrate from Japan. The explanation could be that labor segmentation reduces foreign workers' expected future wage. Furthermore, a lifetime employment system in Japan could reduce the outmigration of Asian- born foreign workers, because reduced risk of future unemployment increases workers' expected wage from working in Japan. Moreover, a higher current job satisfaction could have a negative effect on Asian- born foreign workers'

outmigration intention. Finally, among the control variables of the original motivations of migration, Asian- born foreign workers who were motivated by the Japanese lifestyle tend to remain in Japan, while workers who were originally motived by wages are more likely to outmigrate from Japan in future.

In fact, even as a country with a very small number of foreigners, Japanese policy has long been open for highly skilled foreign workers. Without labor market tests, foreigners easily obtain a Japanese visa if they find a permanent job in Japan (Oishi 2012). However, even compared to non-English speaking countries, the number of foreign workers in Japan is relatively small. The Japanese employment system has been considered as the reason (Morita 2017), and many firms tried to provide different employment systems for foreign workers (JETRO 2017, p.79). However, a recent study found that different career tracks between Japanese and foreign workers reduce foreigners' wages (Holbrow and Nagayoshi 2016). In this study, we found that differentiating foreign labors from Japanese labors increases the outmigration intention of Asian- born foreign workers. If the Japanese employment system is an obstacle for retaining highly skilled foreigners, an effective solution should be reforming the entire system, rather than merely separating foreigners from it. Indeed, much effort has been put into reforming Japan's conventional employment system, and it could not only benefit Japanese workers but also help attracting highly skilled foreign labors.

Last, the study found that Asian- born workers who have high expectations for the Japanese lifestyle are not disappointed, and are more likely to live in Japan permanently in future. Even though there are some discriminations in Japanese society against foreigners (MOF 2017), the Japanese lifestyle may generally satisfy most foreigners and contribute to their stay intentions. For instance, Chinese workers, who comprise nearly two thirds of highly skilled foreign workers, experience fewer discriminations when migrating to Japan than to large Chinese cities, because they have many difficulties in receiving local social welfare, child education, and others, in large Chinese cities such as Beijing and Shanghai if they were not born there. However, in nearby Japan, foreigners are able to enjoy social welfare and services as Japanese, as long as they have a visa that lasts for one year or longer. As a result, promoting Japanese social welfare for foreigners may be an effective method in support of policies that attract highly skilled foreign labors.

The limitation of the study is that workers who were born in European, Australian and North American countries, composing 5%-10% of all foreign workers in Japan, were almost not included in the sample because of lack of data. Therefore, the results of the study are limited to workers who were born in Asian countries in Japan.

Appendix

Theoretical model of this study: analysis based on neoclassical economic theory of migration

Assume the expected wage level of a highly skilled foreign worker is determined by the local average wage level, skills of the worker, returns on skills, and the probability to be employed in the expected period. These ideas are similar to those of Borjas and Bratsberg (1994) and Todaro (1969). We consider two kinds of skills of foreign labors. The first is the general skills obtained from education. The second is foreigner-specific skills, such as native-level foreign language and familiarity with foreign affairs.

The expected wage level if the worker continues working in Japan is given by

$$w\_expe_0 = \overline{w\_aver_0}(edu)^{\beta_0}(e^{ski_f})^{\gamma_0}prob_0\varepsilon_0 \ ,$$

where 0 denotes Japan, w_expe is the expected wage level, $\overline{w\_aver}$ is the local average wage level of all workers, edu is the education level of the worker, ski_f is whether the worker is hired for foreigner-specific skills, $prob$ is the probability to be employed in the expected period, and ε is the error term.

Similarly, the expected wage level if the worker moves out of Japan is given by

$$w\_expe_1 = \overline{w\_aver_1}(edu)^{\beta_1}(e^{ski_f})^{\gamma_1}prob_1\varepsilon_1$$

where 1 denotes the country where the foreign worker plans to go outside Japan, for example, the home country of the foreigner worker.

The migration decision is determined by the difference between w_expe_0 and w_expe_1 (Greene 2008, pp.770-777):

$$lnw_{expe_1} - lnw_{expe_0} = \left(lnw_{aver_1} - lnw_{aver_0}\right) + (\beta_1 - \beta_0)lnedu + (\gamma_1 - \gamma_0)ski_f + (lnprob_1 - lnprob_0) + (ln\varepsilon_1 - ln\varepsilon_0)$$

The foreign worker intends to stay in Japan if $(lnw_{expe_1} - lnw_{expe_0}) \leq 0$, while she/he intends to move out of Japan if $\left(lnw_{expe_1} - lnw_{expe_0}\right) > 0$.

In estimation, denote the migration intention as M, in which M=1 if the foreign workers intend to leave Japan, while M=0 if not. Assuming a normal distribution of the model, the

probit model of the migration intention is as follows:

$$Prob(M = 1) = Prob\left(\ln w_{expe_1} - \ln w_{expe_0} > 0\right) = \Phi[\left(lnw_{aver_1} - lnw_{aver_0}\right) + (\beta_1 -$$

$$\beta_0)lnedu + (\gamma_1 - \gamma_0)ski_f + (lnprob_1 - lnprob_0) + (ln\varepsilon_1 - ln\varepsilon_0)]$$

As a result, the theoretical probability to leave Japan could be decreased by a higher average wage in Japan and a higher probability to be employed in Japan. Further, if the general human capital of education is valued more highly in Japan than in other counties, that is, $(\beta_1 - \beta_0) < 0$, a higher level of education could reduce the intention to leave Japan. On the contrary, it is possible that $(\beta_1 - \beta_0) = 0$ or $(\beta_1 - \beta_0) > 0$ if education is not valued more highly in Japan, or even valued lower in Japan than in other countries, respectively. Similar is the analysis on foreigner-specific skills in the model. Finally, a higher probability to be employed in Japan also reduces the return intention.

References

Borjas, George J., and Bernt Bratsberg, 1994. *Who leaves? The outmigration of the foreign-born*. No. w4913. National Bureau of Economic Research.

Cassarino, J.P., 2004. Theorising return migration: The conceptual approach to return migrants revisited.

Cohen, Y., and Y. Haberfeld, 2001. Self-selection and return migration: Israel-born Jews returning home from the United States during the 1980s. Population Studies 55(1), 79–91.

Constant, A., and Douglas S. Massey, 2002. Return migration by German guest workers: Neoclassical versus new economic theories. *International Migration* 40(4), 5–38.

Constant, Amelie, and Douglas S. Massey, 2003. Self-selection, earnings, and out-migration: A longitudinal study of immigrants to Germany. *Journal of population Economics* 16(4), 631–653.

De Haas, Hein, and Tineke Fokkema, 2011. The effects of integration and transnational ties on international return migration intentions. *Demographic research* 25, 755.

De Jong, Gordon F., 2000. Expectations, gender, and norms in migration decision-making. *Population studies* 54(3), 307–319.

Haug, Sonja, 2008. Migration networks and migration decision-making. *Journal of Ethnic and Migration Studies* 34(4), 585–605.

Holbrow, Hilary J., and Kikuko Nagayoshi, 2016. Economic integration of skilled migrants in Japan: the role of employment practices. *International Migration Review* 2016.

Immigration Bureau of Japan, Points-based System for Highly Skilled Foreign Professionals. http://www.immi-moj.go.jp/newimmiact_3/en/system/index.html

Japan External Trade Organization (JETRO) (2017)「2016 年度日本企業の海外事業展開に関するアンケート調査 ―JETRO 海外ビジネス調査」
https://www.jetro.go.jp/ext_images/_Reports/01/5b57525465154f73/20160135.pdf

The Japan Institute for Labour Policy and Training (JILPT) (2009) 「日本企業における留学生の就労に関する調査」
http://www.jil.go.jp/institute/research/2009/documents/057.pdf

Jensen, Peter, and Peder J. Pedersen, 2007. To stay or not to stay? Out‐migration of immigrants from Denmark. *International Migration* 45(5), 87–113.

Oishi, Nana. The limits of immigration policies: The challenges of highly skilled migration in Japan. *American Behavioral Scientist* 56(8), 1080–1100.

Makina, Daniel, 2012. Determinants of return migration intentions: Evidence from Zimbabwean migrants living in South Africa. *Development Southern Africa* 29(3), 365–378.

Ministry of Justice (MOF), 2017, 外国人住民調査報告書,
http://www.moj.go.jp/content/001226182.pdf

METI 2015 「「アジア人財資金構想」事業結果まとめ」
http://www.meti.go.jp/policy/asia_jinzai_shikin/saishu_matome.pdf

MHLW 「非正規雇用」の現状と課題

http://www.mhlw.go.jp/file/06-Seisakujouhou-11650000-Shokugyouanteikyokuhakenyukiroudoutaisakubu/0000120286.pdf

Morita, Liang, 2017. Why Japan isn't more attractive to highly skilled migrants. *Cogent Social Sciences* 3(1), 1306952.

Liu, Yang. 2016. *To Stay or Leave? Migration decisions of foreign students in Japan*. RIETI Discussion Paper Series 16-E-097.

National Statistics, Republic of China (Taiwan)(NSRC), https://eng.stat.gov.tw/point.asp?index=1

Osanami, Törngren S., and H.J. Holbrow, 2017. Comparing the Experiences of Highly Skilled Labor Migrants in Sweden and Japan: Barriers and Doors to Long‐term Settlement. *International Journal of Japanese Sociology* 26(1), 67–82.

Steiner, Viktor, and Johannes Velling, 1994. Re-migration behavior and expected duration of stay of guest workers in Germany. In: *The economic consequences of immigration to Germany*, pp. 101–119. Physica, Heidelberg.

Takenaka, Ayumi, Makiko Nakamuro, and Kenji Ishida, 2016. Negative assimilation: How immigrants experience economic mobility in Japan. *International Migration Review* 50(2), 506–533.

Todaro, Michael P., 1969. A model of labor migration and urban unemployment in less developed countries. *The American economic review* 59(1), 138–148.

Van Hook, J., and Zhang, W., 2011. Who stays? Who goes? Selective emigration among the foreign-born. *Population research and policy review*, 30(1), 1–24.

Net Ease, 2015, http://news.163.com/15/0421/11/ANNKMNHM00014AED.html

Waldorf, Brigitte, 1995. Determinants of international return migration intentions. The Professional Geographer 47(2), 125–136.

World Bank Open Data (WBOD), https://data.worldbank.org/

Yamaguchi, Rui, and Yutaka Maeda, 2015. Can Japanese Firms Get Along with Highly Skilled Foreign Workers? Intentions among Former International Students to Settle and Work in Japan. Institute of Comparative Economic Studies Working Paper 194, Hosei University, pp.1–28.

Table 1. Data summary

Table 1.1 Country proportion

Country of origin	Proportion (%)
China	77.4
Korea	7.4
Taiwan	4.1
Bangladesh	0.9
Malaysia	2.2
Vietnam	1.8
Thailand	0.8
Sri Lanka	0.4
Nepal	0.4
Mongolia	0.4
Indonesia	0.3
United States	0.1
United Kingdom	0.1
Russia	0.2
Others	3.3

Table 1.2 Descriptive statistics

	Obs	Mean	Std. Dev.	Min	Max
Workers					
Age	899	31.10	5.88	23	55
Male	901	0.57	0.49	0	1
Language	887	1.72	0.62	1	5
Past stay in Japan	900	5.05	0.70	1	6
Marry Japanese	902	0.07	0.26	0	1
Out-migration	873	0.36	0.48	0	1
Education	892	3.58	0.83	1	5
Average wage gap	802	-2.28	0.65	-2.53	-0.53
Segmentation	1120	0.27	0.44	0	1
Lifetime employment	899	0.87	0.34	0	1
Initial motivation of high wage	899	0.17	0.37	0	1
Initial motivation of living conditions	899	0.26	0.44	0	1
Initial motivation of firms' tech. and brand	899	0.81	0.39	0	1
Job satisfaction	891	3.22	0.69	1	4
Overtime work frequency	901	2.16	0.73	1	3
Managerial job	896	1.15	0.48	1	4
Have foreign managers	963	0.43	0.50	0	1
	Obs	Mean	Std. Dev.	Min	Max
Firms					
Firm size	3429	2.88	0.88	1	4
Foreign firm	3398	0.02	0.13	0	1
Overseas activity	3429	0.45	0.50	0	1
Merit-based evaluation	3396	3.01	0.71	1	4
Early selection in promotion	3366	2.51	0.74	1	4
Work life balance	3389	2.91	0.66	1	4

Table 2. Estimation results

	Model 1: Return migration			Model 2: Out-migration		
Major model						
Segmentation	0.33	0.26	0.30	0.33	0.27	0.28
	[2.05]**	[1.67]*	[1.88]*	[2.35]**	[1.99]**	[2.02]**
Education	0.06	0.05	0.05	0.02	0.01	0.01
	[0.63]	[0.51]	[0.56]	[0.24]	[0.15]	[0.09]
Wage gap	-0.08	-0.14	0.01	—	—	—
	[-0.42]	[-0.75]	[0.06]	—	—	—
lifetime employment	-0.37	-0.36	-0.33	-0.34	-0.35	-0.32
	[-1.89]*	[-1.88]*	[-1.68]*	[-1.92]*	[-2.01]**	[-1.85]*
Initial motivation						
Initial motivation	0.61	0.57	0.60	0.64	0.62	0.61
of high wage	[3.41]***	[3.34]***	[3.36]***	[4.10]***	[4.11]***	[3.95]***
Initial motivation	-1.21	-1.20	-1.22	-0.97	-0.98	-0.97
of living condition	[-6.92]***	[-7.11]***	[-7.11]***	[-6.70]***	[-7.02]***	[-6.81]***
Initial motivation	-0.07	-0.08	-0.18	-0.02	-0.02	-0.12
of tech. and brand	[-0.45]	[-0.49]	[-1.20]	[-0.14]	[-0.15]	[-0.88]
Employment practi.						
Job satisfaction	-0.45	-0.43		-0.47	-0.46	
	[-4.87]***	[-4.79]***		[-5.72]***	[-5.71]***	
Overtime work	0.04		0.05	0.03		0.06
	[0.41]		[0.58]	[0.44]		[0.80]
Merit- based evaluation	0.07		0.05	0.10		0.08
	[0.55]		[0.40]	[0.92]		[0.80]
Early selection in promotion	-0.05		-0.02	0.04		0.07
	[-0.52]		[-0.24]	[0.56]		[0.83]
Work life balance	0.16		0.08	0.13		0.06
	[1.62]		[0.85]	[1.45]		[0.66]

Table 2. Estimation results (continued)

	Model 1: Return migration			Model 2: Out-migration		
Personal characteristics						
Age	-0.02	-0.02	-0.01	-0.03	-0.03	-0.02
	[-1.17]	[-1.14]	[-0.68]	[-1.96]*	[-2.04]**	[-1.54]
Male	0.09	0.07	0.11	0.01	-0.02	0.02
	[0.64]	[0.52]	[0.86]	[0.04]	[-0.16]	[0.13]
Language	-0.05	-0.04	-0.04	-0.01	0.00	0.00
	[-0.42]	[-0.37]	[-0.39]	[-0.15]	[-0.03]	[0.05]
Past stay in Japan	-0.25	-0.25	-0.27	-0.14	-0.13	-0.14
	[-2.11]**	[-2.09]**	[-2.31]**	[-1.46]	[-1.36]	[-1.45]
Marry Japanese	-0.74	-0.88	-0.80	-0.32	-0.48	-0.37
	[-2.03]**	[-2.50]**	[-2.40]**	[-1.27]	[-1.93]*	[-1.56]
Managerial job	-0.16	-0.08	-0.19	-0.09	-0.01	-0.13
	[-0.91]	[-0.50]	[-1.11]	[-0.60]	[-0.09]	[-0.87]
Firm characteristics						
Firm size	0.06	0.09	0.10	-0.01	0.02	0.03
	[0.75]	[1.07]	[1.15]	[-0.11]	[0.26]	[0.37]
Have foreign managers	0.08		0.10	0.03		0.06
	[0.58]		[0.70]	[0.22]		[0.44]
Foreign firm	0.49		0.46	0.34		0.32
	[0.97]		[0.94]	[0.99]		[0.95]
Oversea activity	0.26		0.33	0.15		0.21
	[0.99]		[1.30]	[0.70]		[0.99]
Job dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.78	2.36	0.73	2.01	2.76	0.39
	[1.39]	[1.99]**	[0.59]	[2.02]**	[3.02]***	[0.42]
Log likelihood	-303.83	-317.11	-319.07	-392.60	-410.06	-414.10
N.	606	631	614	712	742	721

Notes: Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level (z-statistics in parenthesis).