

**Chukyo University Institute of Economics**

**Discussion Paper Series**

February 2016

No. 1505

The Economics of International Immigration:  
Introduction and Summary

Kenji Kondoh

# The Economics of International Immigration: Introduction and Summary

Kenji Kondoh

## 1.1 Introduction

### *1.1.1 Historical View of International Immigration*

Although many East Asian countries have been the source countries of many international migrant workers, the history of introducing foreign workers is relatively recent and short. For example, in Japan, it has been only in the last 25–30 years that remarks have been made about the supposed and various social problems stemming from foreign workers. On the other hand, as international migration has a comparatively longer history in the United States and Europe, it is necessary to review the historical facts that pertain to Western human mobility, as possible precedents. Especially, as the subjects of future research, the economic effects of international immigration are quite important and worthy of study in the context of East Asian countries (including Japan, South Korea, and Taiwan). In this chapter, we briefly review the historical development of international migration in the United States and Europe, as well as worldwide.

In the 19th century, several European economies were supported by immigrants from neighboring countries. For example, seasonal Polish workers contributed to developments in agricultural businesses managed by junkers in Prussia. However, the largest influx of international migration has been to the United States. Following the Pilgrims' arrival in the 17th century, transmigration by Anglo-Saxon individuals started to predominate labor flows to North America. Since about the mid-19th century, owing to the industrial revolution, workers from southern Europe (e.g., Italy and Greece), eastern Europe (e.g., Russia, Poland, Czechoslovakia, and Romania), and Ireland started to migrate to the United States. It is necessary to remark that not a few of them were Jewish origin. It is known that around 60 million workers moved from Europe to the United States in the 100 years before WWI. We also see in this period a huge influx of immigration to the United States by Chinese people, who were employed as low-cost rail construction workers and/or mine workers; they established Chinatowns in several California cities.

At the beginning of the 20th century, while Chinese workers had been prohibited (as of 1882) and their numbers therefore restricted, the number of Japanese immigrants started to increase. In the 1880–1890 period, only 1,583 Japanese individuals obtained lawful permanent resident status in the United States; in the 1890–1900 period, that number increased to 13,998. In 1900–1910, it reached 139,712.<sup>1</sup> These individuals were employed as rail construction workers and/or mine workers, similar to Chinese workers. Moreover, some Japanese who had launched careers as agricultural seasonal workers successfully stepped up to become tenant farmers; after that, they became medium-scale farm managers. In looking at these success stories, one notices that diligent Japanese workers came to be regarded as the “Yellow Peril” that, according to the propaganda, would surely absorb all the job opportunities otherwise available to domestic white, Anglo–Saxon protestant workers. This caused a campaign to exclude the Japanese; as a result of that campaign, the Immigration Act of 1924 was realized. We need to note that before WWII, all Asian countries—including Japan—had been the source countries of international migration; indeed, the Japanese government encouraged emigration to Hawaii, the mainland United States, Canada, and Brazil, to protect its growing population from poverty and starvation. Following exclusion as per US law, mainstream labor outflows comprising Japanese individuals came to represent pioneering migration to former Manchuria; around 270,000 people had moved by the end of WWII.

After WWII, each of the Western countries, while facing a new phase of international immigration, was under intense pressure from the public to draw up some new and effective policies. This was the case not only in the United Kingdom (which faced huge labor inflows from its former colonies) and France (which confronted immigration from West Africa); the negative effects of immigration were also quite serious in the United States, which had (and still has) an approximately 3,000-km land border with Mexico. In the United States, during the serious economic recession period of the 1930s, immigration was tightly restricted. However, in 1942—just after the United States entered WWII—the US government promoted the two-country agreement called the “Bracero Program,” which intended to introduce legal and temporary farm workers from Mexico, so as to compensate for labor shortages. This program ended in 1965, but on account of it, plenty of Mexican workers “overstayed”; there were many new illegal immigrants from Mexico, given the high demand for low-cost workers among southern US farms and manufacturing industries. Taking the lead of the United Kingdom (1981) and France (1983), the United States changed its immigration policy by

---

<sup>1</sup> 2013 Yearbook of Immigration Statistics.

virtue of the Immigration Reform and Control Act of 1986 (IRCA), which intended to permit legal employment among foreign illegal residents; on the other hand, however, it restricted new immigration by punishing employers who employed illegal workers.

In West Germany, there was a shortage of younger-generation workers, on account of restricted human return inflows from eastern Europe; this restriction stemmed from the erection of the Berlin Wall. On account of this shortage, the use of foreign workers had been a matter of national policy since the 1960s. Initially, the German government adopted a rotation system, which envisioned the use of the temporary immigration of foreign workers, and not the establishment of permanent residents; in this system, single workers were supposed to return after a certain period. This system also considered the technical transfer merits of skilled returned workers. Agreements among Italy, Greece, Spain, Turkey, and the former Yugoslavia were established, but following the establishment of the European Economic Community and the European Commission (EC), as unequal treatment among workers from different member nations was prohibited, Turkish and Yugoslavian workers became the main guest workers during the 1970s and 1980s. This system caused a dual labor market, where unskilled guest workers occupied the lower stratum and were employed atypically. Those workers were very convenient for employers, as they could be easily dismissed in line with production adjustments; their promotion was not considered.

However, the original plan became impossible to maintain, as most foreign workers brought their families and resided permanently in Germany, rather than quickly return to their home countries. There were two reasons why the guest workers decided not to return. First, employers made great efforts and invested considerable funds to recruit and train workers; naturally, teaching everything to a new group faces on a constant basis—which happens in cases of high turnover among migrant workers—incur large amounts of time and resource waste. Second, given the economic stagnation in their home countries, it was quite difficult for guest workers to find reasonable job opportunities where they could utilize the skills and experiences they had obtained in Germany; therefore, they considered that their expected lifelong income in Germany would be higher than that in their home country. A serious economic recession caused by the first oil crisis exacerbated the situation, and in 1973, the German government decided to stop inviting foreign workers.

Since the 1980s, German immigration policies have been based on two strategies—namely, that which encourages their return home or, otherwise, that which adapts them to German culture. Fiscally, it was very expensive to promote immigrants' return, especially while restrictions on labor inflows were incomplete. Illegal

immigrants were employed in the absence of legal protections; their job conditions were quite poor and dangerous, and their wages were often far too low. With respect to assimilation policies, for most foreigners, given the language barrier, there existed serious problems in the classroom, and limited communication between immigrants and native German people created residential areas for foreigners. As a result, one cannot say that those policies were successful. It might be necessary to mention that in Australia in the late 1970s, policies with respect to refugees from Vietnam changed from those favoring assimilation (similar to German policies) to those favoring multiculturalism, where cultural differences between Anglo-Saxon individuals and immigrants were respected by both parties. This concept is now commonly accepted and has been developed on a widespread basis in developed Western host countries.

Turning our attention to non-Western countries, oil-producing countries in the Middle East have also been host countries of international immigration. In Kuwait, the number of foreigners (around 40% of whom were from Jordan and Palestine) dominated the domestic population in 1965. In Saudi Arabia, 134 million foreign workers (around 40% of whom were from Yemen) were employed in 1980, and they outnumbered even domestic workers. In these countries, immigrants from non-oil-producing Arabic countries comprised the core base of the migrant workers. On the other hand, many Indian and Pakistani workers had moved to Qatar, Bahrain, and the United Arab Emirates. In Bahrain, more than 50% of foreign workers were from those countries, and in Qatar, the ratio of foreigners to total employees in 1975 exceeded 80%. Those workers brought with them their wives and children, and they all became permanent residents in those countries. (We need to remark here that many of these transitions were not overly difficult, as many of them were of Arabic ethnicity, and/or were Muslim.) Following the oil crisis, given the high demand for construction workers—mainly for projects supported by foreign investments from the United States and Japan—the numbers of workers from South Korea, Thailand, Indonesia, and the Philippines increased rapidly. Unlike the Arabic-Muslim workers, these individuals were temporary workers who would return just after their contract of employment expired.<sup>2</sup> However, during the 1980s, those Asian workers started to be deported to their home countries, owing to new policies among oil-producing countries that gave priority to the employment of native workers.

### ***1.1.2 International Immigration in Asian Countries***

---

<sup>2</sup> Briks and Sinclair (1980).

According to the United Nations' International Migration Report 2015, the number of international migrants worldwide has continued to grow rapidly over the last 15 years, reaching 244 million in 2015; this is a 3.4-fold increase over the 71 million migrants in 2000. Today, 75 million migrants now live in Asia; on the other hand, 104 million workers moved from Asia and now live outside it. Figures 1.1 and 1.2 show the number of international migrants in 2000 and in 2015. In reality, as shown in Figure 1.3, 62 million Asian workers (around 60% of all migrants) have migrated to other Asian countries; therefore, there are 42 million international migrants who were born in Asia but live elsewhere, and 13 million international migrants who were born outside Asia but now live in Asia. The implication here is that Asia is still a very large net exporter of labor; especially, India has the largest “diaspora” worldwide (16 million). However, it is very important to note that relatively developed countries in Asia have accepted 62 million workers from inside Asia—a number four times larger than the number of immigrants from outside Asia. Given these facts, the topic of Asian international immigration can almost be construed as one of internal migration within Asia.

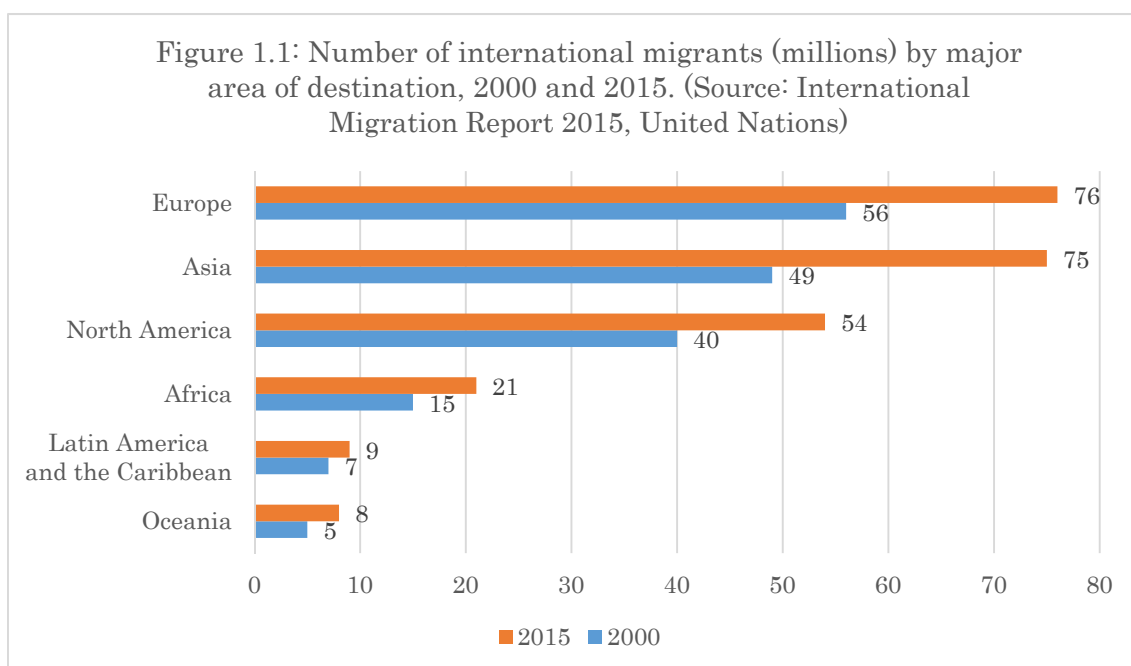


Figure 1.2: Number of international migrants (millions) by major area of origin, 2000 and 2015. (Source: International Migration Report 2015, United Nations)

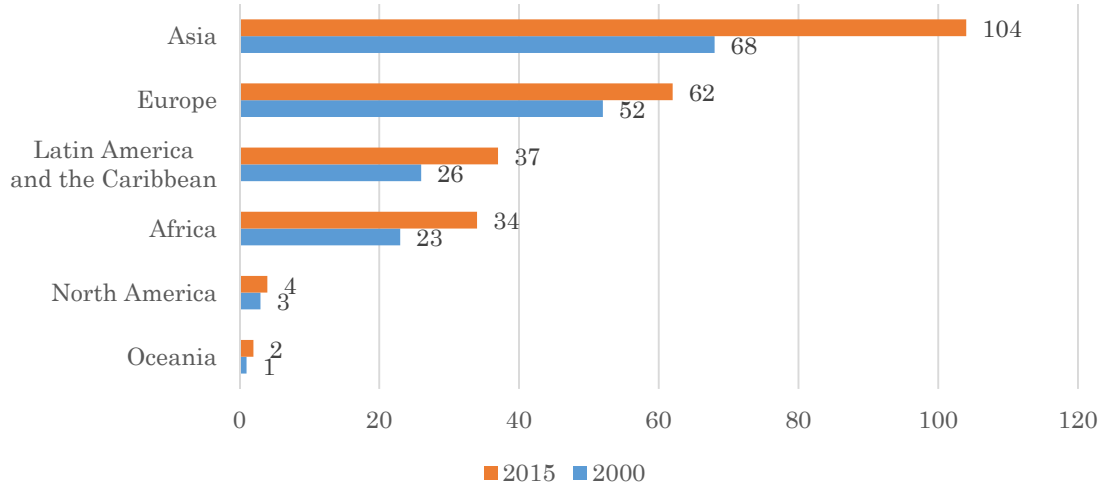
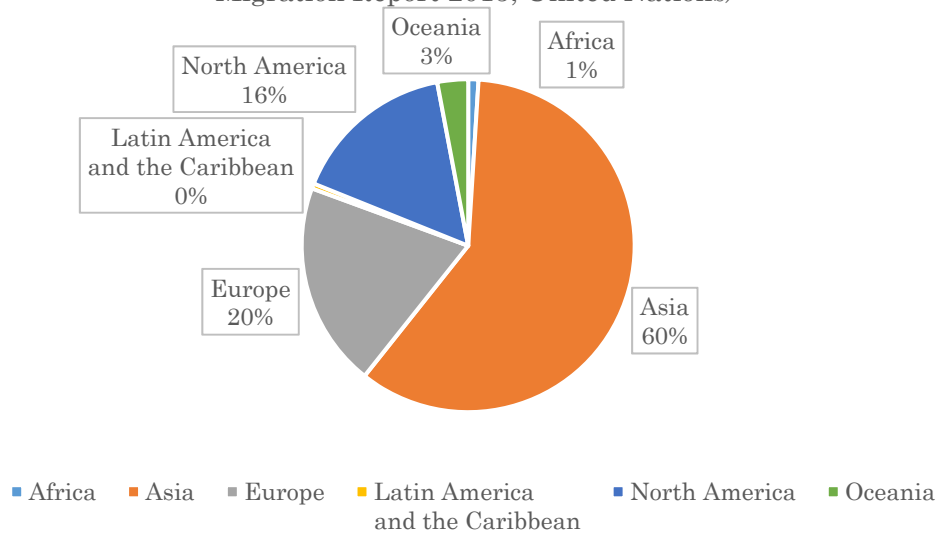


Figure 1.3: Percentage distribution of international migrants from Asia by major area of destination, 2015 (Source: International Migration Report 2015, United Nations)



Concurrent with employment restrictions in Middle Eastern countries, in the 1980s, the amount of international migration within the East and Southeast Asian zone started to increase. Female workers in Indonesia, Myanmar, the Philippines, and Vietnam moved to Singapore and Taiwan for housemaid job opportunities. Especially, the Philippines has made great efforts to send workers abroad, so that it may obtain hard currencies (i.e., via workers' remittances). That country was the largest source

country of migration in the Asian zone; in the mid-2000s, a total of 4.75 million Filipinos were employed abroad.

On the other hand, in East Asian countries such as Japan, Taiwan, and South Korea, as surplus labor in the agricultural sector had already been absorbed by urban manufacturing sectors by the late 1970s, several problems stemming from labor shortages started to emerge. To mitigate high human costs, after the 1980s, large enterprises in those countries expanded their business to Asia's developing countries by undertaking foreign direct investment (FDI). However, in several industries—such as construction and service—it was impossible to overcome labor shortages without the help of foreign workers, many of whom dared to work in poor and severe conditions and for relatively lower wages.

Japan has been considered a racially homogeneous nation. Because of its historical background, many foreign residents there are second and third-generation ancestors of South Korean and Chinese immigrants. Until the 1980s, the number of foreign workers remained very small. In 1976, visitors from abroad reached 1 million for the first time, and the number of employed foreign workers was only around 20,000. The main reason for this limited employment was the legal restriction. In Japan, it was impossible to employ foreign unskilled workers legally, and legal work visas were issued only to those in the following special categories: diplomat, official, professor, artist, religious activities, journalist, investor/business manager, legal/accounting services, medical services, researcher, instructor, engineer, specialist in humanities/international services, intra-company transferee, entertainer, skilled labor, and cultural activities.

However, during the so-called bubble economy of the late 1980s, there was a serious labor shortage in Japan. To satisfy the high demand for workers, the Japanese government started to introduce second and third-generation Japanese–Brazilians as legal unskilled workers. This was an extraordinary step, and even now it is the sole exception to the general exclusion principle with respect to foreign unskilled workers. Moreover, we need to remark that the number of illegal foreign unskilled workers also started to increase. Formerly, female workers from the Philippines and Thailand employed in the sex-trade industry constituted a majority of illegal unskilled foreign workers in Japan. However, after the late 1980s, the number of male illegal immigrants from Pakistan, Iran, and Bangladesh started to increase rapidly, and most of them were employed as construction workers, factory workers, and odd-jobbers. The ordinary “trick” among them was to enter as a temporary visitor and overstay beyond the permitted period. Another track of illegal employment was to undertake activities other than those permitted under their status of residence. Students, mainly from China, who were



permitted to stay as college students or pre-college students were allowed to work four hours per day, at most; sometimes, however, they were employed as full-time workers, and no real studying took place.

We can consider three reasons as to why there was such a rapid increase in illegal immigrants. First, back then, there existed a large gap in per-capita gross domestic product (GDP) between Japan and Asia's developing countries. Moreover, following the Plaza Agreement, the increased value of the Japanese yen against the US dollar furthered widened the gap. Back then, even though immigrants were paying expensive flight charges and broker commissions, and even though their payment was one-half or one-third that of Japanese domestic workers, within one year, their total income would be greater than that they left behind in their home countries. We refer to this as a "push factor." Second, the Middle Eastern nations—which were formerly the main host countries of international migration—had just started to exclude international immigrants because of a decline seen among oil-dependent economies and the preferential treatment of domestic workers. On the other hand, because of Japan's unprecedented economic prosperity, foreign workers were attracted by small and medium-sized enterprises that were suffering from labor shortages. We refer to this as a "pull factor." Third, we can remark on the existence of brokers who intermediate between workers and Japanese firms. They encouraged illegal immigration through the falsification of passports, or marriage with Japanese nationals; they also bankrolled the financial costs associated with necessary trips. Illegal immigrants were often held in servitude by brokers until they refunded those debts. We refer to this as an "intermediate factor."

Following the collapse of the so-called bubble economy, the Japanese economy worsened, and the related economic recession continued for almost 20 years. Job opportunities for foreign workers, both legal and illegal, were limited during that time, and some immigrants were dismissed and sent home. Despite the existence of a serious economic depression, the number of foreign workers in Japan continued to increase. The main reasons for this growth were as follows. First, following a luxurious bubble-economy period, Japanese young people acquired a deep antipathy for engaging in "dirty, dangerous, and demeaning" (3D) jobs. Thus, even though there exist many regular job vacancies in 3D industries, new graduates have instead opted for part-time positions with the hope of finding better jobs during the next seasonal job search. Therefore in certain jobs, labor shortages have remained, and foreign unskilled workers continue to be employed. In addition, Japan's declining birthrate and aging population have reinforced a continuous labor shortage in the manufacturing industry. Second,

China's rapid economic growth has made it possible for a large number of Chinese citizens to study abroad. Additionally, due to Japan's global strategy, the capacities of foreign college students and pre-college students increased; this increased the number of Chinese residents and, as a result, the numbers of both temporary and regular Chinese workers employed in Japan also increased promptly.

It is difficult for foreign unskilled workers to be legally employed in Japan, but there are three extraordinary ways in which this can occur. The first, as mentioned before, pertains to the special treatment of ethnic Japanese. The second is through a technical intern training program. This was established in 1993, with the main purpose of having workers "learn by doing" at factories, to improve the skills of foreign workers newly acquired during their stay as trainees. Interns were treated as workers by employers, even as their legal protections were insufficient; this inconsistency created several troubles with respect to wages and overtime hours. Another problem was that interns sometimes could not acquire the promised skills, and were then compelled to engage in jobs suitable for unskilled workers. Moreover, in the case of successful skill acquisition, the industrial techniques sometimes did not align with the needs or conditions of their home country, because of different natural environments or a low demand for that skill. Those workers were permitted a working period that extended to five years, and to compensate for the decreasing number of Brazilians of Japanese parentage, many Japanese firms actively try to introduce interns as temporary unskilled workers. The third way is to be a nursing care worker systemized by an Economic Partnership Agreement (EPA). The Japanese government has already concluded EPAs with Indonesia (since 2008), the Philippines (since 2009), and Vietnam (since 2014), and all involve the introduction of certain numbers of nursing care workers. Those workers should work as trainees in hospitals or care homes and, at the same time, study the language and acquire nursing skills and knowledge. They must pass state examinations for specialists, within a limited period (generally three years, and one additional year under certain conditions for nursing license, or four years, and one additional year under certain conditions for licensed nursing care workers). If they fail the examinations, they must return home. These nursing licenses have been difficult to obtain: only 23% of the applicants who entered between 1998 and 2001 passed the examination, while among licensed nursing care workers, around 50% of applicants succeeded. These difficulties—caused mainly by the Japanese-language barrier—have been regarded as problems among the countries involved, even though some conditions were relaxed to enhance the applicant passing rate.<sup>3</sup>

---

<sup>3</sup> Ministry of Health, Labour and Welfare, Japan (2015).

Figures 1.4 and 1.5 show recent trends with regards to immigrants to Japan. By the end of 1990s, the number of official foreign workers in Japan was over 1,000,000; this number was around 2,000,000 in 2006. In 2014, this number was around 2,120,000, thus constituting approximately 1.57% of Japan's total population. According to statistics pertaining to the number of foreign residents by nationality/region of origin, at the end of 2014, China stood at 654,777, accounting for 30.9% of all immigrants. China was followed by South Korea (501,230; 23.6%), the Philippines (217,585; 10.3%), Brazil (175,410; 8.3%), and Vietnam (99,865; 4.7%).

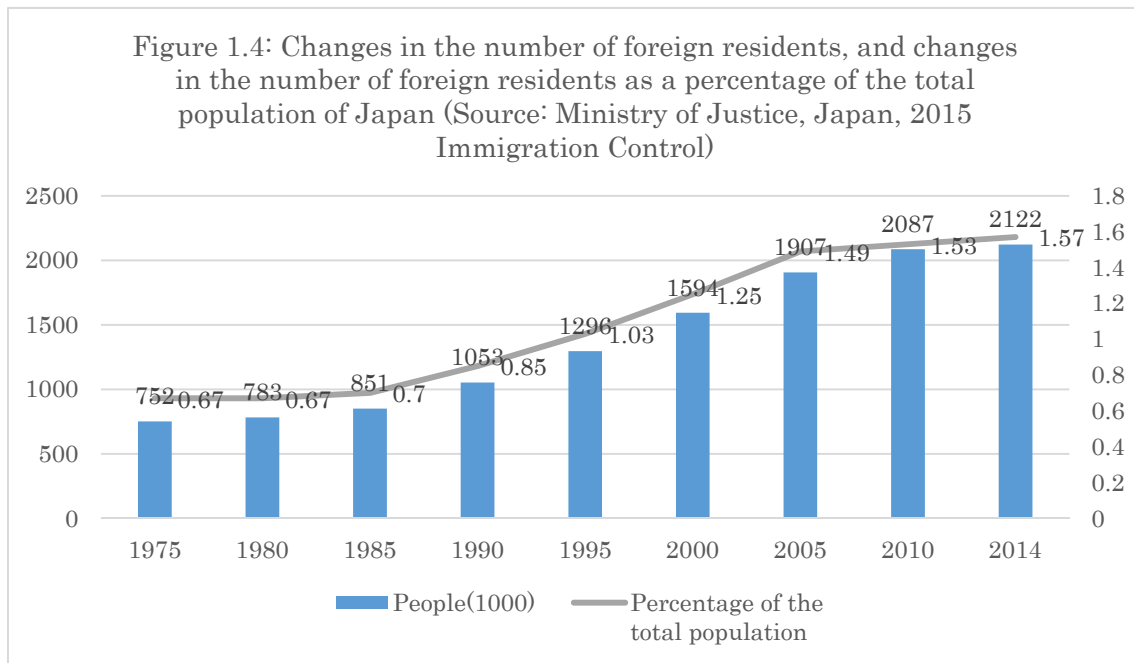
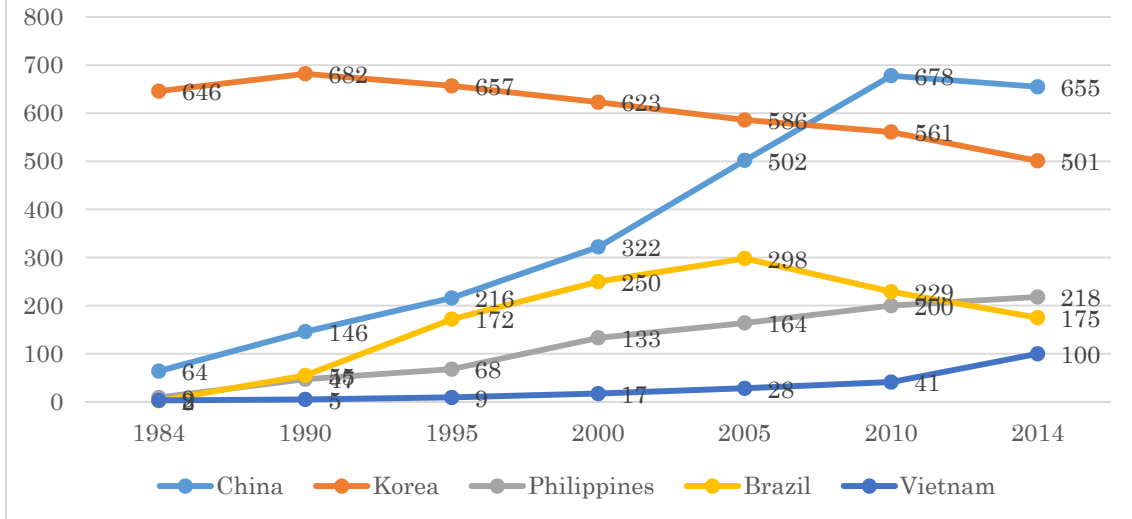


Figure 1.5: Changes in the number of foreign residents by major nationality/region (thousands of people) (Source: Ministry of Justice, Japan, 2015 Immigration Control)



In South Korea, in spite of a serious labor shortage caused by economic development, there existed until the early 2000s a tendency to restrict immigration. As in Japan, immigrants to South Korea needed to be in possession of some kind of listed special skill if they wished to be visa status holders. Since the 1990s, owing to serious labor shortages, on the pretext of providing aid by which to improve industrial technology in developing countries, a technical intern training system was introduced; it implied the approval of foreign unskilled workers' employment, under certain limited conditions. However, trainees often "ran away" from the factories that had accepted them, to seek out better jobs with higher wages and became illegal workers. To mitigate the "problem" of illegal workers, in 2003, the South Korean government legalized existing illegal immigrants and in 2004, a new employment permission system was introduced. This implied the legal introduction of foreign unskilled workers, and following agreements among Asian countries, the rate at which foreign workers were accepted expanded rapidly. South Korea concluded this agreement with 15 countries, and workers arrived mainly from China and Vietnam. The number of foreigners in South Korea grew to 1,797,618 by 2014; additionally, another 208,778 illegal immigrants have remained. By nationality, the largest groups of immigrants were Chinese (898,654; 50.0%), American (136,663; 7.6%), Vietnamese (129,973; 7.2%), Thai (94,314; 5.2%), Filipinos (53,538; 5.2%), and Japanese (49,152; 2.7%).<sup>4</sup>

In Taiwan, immigration in earnest started with the introduction of foreign

<sup>4</sup> Status of Foreigners, Statistics Korea.

unskilled workers in 1991. Only 2,999 immigrants from Thailand were employed by the public sector construction industries. Following an extension of the period during which immigrants were allowed to stay—as well as high demand for immigrant workers, owing to a declining birthrate and an aging population—the number of immigrants continued to increase; in 2013, they numbered around 490,000. Currently, foreign unskilled workers are mainly employed by the manufacturing and nursing care industries, and the major source countries of those workers are Indonesia, Thailand, the Philippines, and Vietnam.

Other Asian net host countries (i.e., “importers”) of international immigration are Singapore, Brunei, Malaysia, and Hong Kong. In Singapore, rapid growth in the 1970s created a serious labor shortage, and the introduction of foreign workers started in earnest. Especially, workers with specialized skills have been welcomed and positively introduced, as part of national policies. With respect to the introduction of unskilled immigrants, two political instruments—namely, an employment tax and an per-sector employment quotas—have been adopted to restrict unskilled foreign workers.

In Malaysia after the 1960s, economic growth in urban industrial areas absorbed rural workers. Thus, labor shortages in rural Malaysian areas gave way to the employment of Indonesian workers on plantation farms. In the 1980s, with large inflows of foreign unskilled workers from nearby countries, the employment of those workers expanded to urban industries; this created serious friction between domestic and foreign workers, and it resulted in restrictions to the entrance of new foreign workers and the legalization of illegal residents. However, there still exist illegal inflows of foreign workers, and approximately 1,000,000 illegal workers are currently thought to work in Malaysia. On the other hand, unlike Japan, Singapore, and South Korea, Malaysia exports a large number of domestic highly educated and skilled workers to highly developed countries; thus, Malaysia is a net host country of international migration but, similar to Thailand, it stands in the midstream of international labor flows as it confronts the simultaneous “brain drain” of skilled workers and the influx of unskilled illegal workers.

Table 1.1 shows the labor flows within various areas in Asia.

Table 1.1: Labor flows of selected Asian countries by destination, 2010–2011

(Source: International Migration Outlook 2012, OECD) (units: thousands)

Source Destination	Nepal	Bangla- desh	Indo- nesia	Sri Lanka	Thai- land	India	Paki- stan	Philip pines	Viet- nam
Brunei		2	11		3	1	66	8	
Taiwan			76		48			37	28
Hong Kong			50		3		22	101	
Malaysia	106	1	134	4	4	21	2	10	12
Singapore									
Japan	1	0	2	0	9		45	6	5
South Korea	4	3	11	5	11		2	12	9

## 1.2 Economic Theory on International Migration: Special Subjects

It is widely known that in the most general and classical framework of international trade theory—namely, the Heckscher–Ohlin–Samuelson (HOS) model—both labor and capital are considered the main production factors. Since the late 1950s, numerous theoretical studies on international factor mobility—such as those of Mundell (1957), MacDougall (1960), Kemp (1966), and Jones (1967)—have been undertaken by extending the HOS model. Most of these studies assume that capital is a production factor with free mobility among countries, while labor mobility is limited only by domestic industries; there is no consideration of international migration. The reasons why theoretical research on international migration has been forestalled are as follows. First, this “falling behind” reflects what was in those days a new economic situation: global firms had just started to undertake FDI, and so international capital movement was a hot topic. Second, back then, the effects of international labor movements were misunderstood as essentially resembling those of international capital movements.

In any case, on account of studies since the 1970s that focus on problems specifically caused by international migration, the special properties of migration and economic differences that stem from capital movement have been becoming clearer. In this section, following an elucidation of early survey studies—such as those of Borjas (1994), Bodvarsson and Van den Berg (2009), and Bodvarsson et al. (2015)—we categorize various subjects pertaining to international migration and summarize earlier research contributions.

### *1.2.1 Unemployment*

“Capital which moved abroad is usually fully employed, while in the usual case some migrants are unemployed.”

In the case of FDI, as multinational firms invest abroad with due consideration, ordinarily, capital is fully leveraged and used in production. If the situation changes, however, firms can easily close projects and withdraw its FDI. Therefore, one rarely finds unemployed capital that is invested abroad. On the other hand, as labor essentially comprises human beings, we find two essential differences that give rise to labor unemployment.

First, for historical reasons, there exists in developed countries a legal minimum wage rate system. Such systems sometimes makes firms reluctant to employ large numbers of workers, because one additional worker’s value in terms of marginal products might be lower than the wage rate paid to him or her. In line with the historical studies of Harris and Todaro (1970)—which focus on urban–rural migration—we also examined studies that extend the Harris–Todaro framework to international migration from a developing country with a competitive wage rate and full employment to a developed country with a legal minimum wage rate and involuntary unemployment. Additionally, the existence of a fixed wage has been explained in terms of the reasonable behavior of firms. For example, we can offer the efficiency wage hypothesis of Shapiro and Stiglitz (1984) and the fair wage–effort hypothesis of Akerlof and Yellen (1990). The pioneering studies on international migration that consider this viewpoint are as follows. Djajic (1987) studied the effects of illegal migration while applying a dynamic two-country model. Bhagwati and Hamada (1974) studied the phenomenon of “brain drain.” Ethier (1985) considered the differences in properties between two types of labor (i.e., immigrants and domestic workers) and theoretically explains the real situation where immigrants are frequently treated as a “safety value” or buffer in employment.

Second, we can assert that the main reason for involuntary unemployment is a mismatch between labor demand and supply. Given the variety of abilities and preferences among job-searching workers, and given the variety of skills and aptitudes demanded by firms, it is difficult but necessary to find optimal matches between workers and firms. Because of information asymmetry—wherein the personal information of one party in a partnership is not easily accessed by the other party—unemployment that stems from matching errors occurs in the absence of sufficient investigation. In line with this perception, Diamond (1982, 2011), Mortensen

(2011), Mortensen and Pissarides (1994, 1999), and Pissarides (1985, 1992, 2000, 2007, 2011) established a basic model of frictional unemployment; it is now known as the DMP model. Concerning the extension of this model to the phenomenon of migration, Park and Kim (2007) undertook an analysis of migration and economic growth, within the framework of a search equilibrium model with a steady state and dynamic transition analysis. Lee (2010) and Battisti et al. (2014) empirically support the use of the calibration approach.

### ***1.2.2 Nontradable Sector***

“Most of Immigrants are employed by labor intensive industries which produce non-tradable goods and services.”

As mentioned for the Japanese case, most unskilled foreign workers tend to be employed in the construction and service industries—neither of which is tradable. It is necessary to arrange the regular HOS model while assuming that one of two goods are nontradable. In the 1980s, several studies focused on this point, and so there is an accumulation of studies from the 1980s and 1990s. For example, we can cite the work of Rivera-Batiz (1982, 1983a, 1983b, 1984, 1986, 1989), Lundahl (1985), Quibria (1988a, 1989, 1993), Quibria and River-Batiz (1989), Thompson (1984), Wong (1995), and Kondoh (1999). We find that even when we relax the basic model and generalize the number of tradable goods, nontradable goods, and production factors, we can assert that following international migration, the economic welfare of the host country will increase, while that of the source country will decrease.

### ***1.2.3 Human Utility Maximization***

“In a short period, similarly both factors, labor and capital, intend to move to the country in which factor prices, wage and rental of capital respectively, are, higher. But capital moves to maximize firms’ profit if capital is owned by firm managers. On the other hand, decisions of migration are done as the consumers’ solutions of utility maximizing problems.”

The studies of Stark (1984), Katz and Stark (1986), Stark and Taylor (1989, 1991), and Stark and Yitzhaki (1988) focus on real psychological aspects—namely, that each individual’s utility is often considered a function of his or her own income, as well as a function of the income gap between him or her, and his or her reference group. An immigrant’s welfare improves, even in the absence of an income change, if the incomes



of those left behind decrease.

There may exist conflicting interests among family members, and they may ultimately affect migration decisions. Mincer (1978) studied the case where one of two family member gains from migration but the other loses. Under no possibility of only one person migrating, family choice is based on joint gain, and they choose migration if the gains from migration for one member exceeds the losses experienced by the other. On the other hand, if we permit a family member's individual migration, one member's decision implies not only his or her utility maximization, but also family portfolio diversification. Stark and Levhari (1982), Stark (1984), and Katz and Stark (1986) modeled the household's decision while considering the aforementioned risk-hedging behavior. Graves and Linneman (1979) also considered family utility; however, on the other hand, they focus on a household's decision to migrate from a dangerous urban area to a safe rural area, along with an increase in income.

With regard to the lifelong utility of migrants, Polachek and Horvath (1977) established a model that considers information-searching and the acquisition of human capital. Djajic and Milbourn (1988) employed a general equilibrium model that features legal temporary guest workers, where immigrants determine the optimal consumption level and staying period by resolving lifelong utility maximization problems. In other words, they consider migration decisions in a life-cycle context. The work of Kondoh (2000) is an extension study that examines both legal and illegal immigrants.

Return migration and repeat migration can also be considered part of the optimal choice with regard to migration duration. Dustmann (1995) and Dustmann and Weiss (2007) each analyzed the behavior of return migrants, while considering human capital accumulation in the host country. Dustmann (1997) and Dustmann and Kirchkamp (2002) considered uncertainty. Dustmann (2003) studied the relationship between the wage gap and migration duration, and Dustmann (2008) focused on investment in children's education. Additionally, Dustmann (1999) focused on the language fluency of migrants. Dustmann and Mestres (2011) investigated the interaction between saving and return migration, while Dustmann et al. (2011) touch upon skill accumulation with immigrants' return. Hill (1987) and Kondoh (2006b) each studied the behavior of workers who pass through borders repeatedly.

Different utility functions among workers may cause bidirectional migration. Galor (1986) and Mueser (1997) studied the bilateral migration case, in which some workers migrate from country A to B, while other workers concurrently migrate from country B to A. Applying a two-period overlapping generations model, Galor (1986) attributes the reason for this bidirectional and mutual migration to differences in

workers' time preferences.

#### ***1.2.4 Capital Owner***

“Sometimes migration implies the capital owners' mobility because migrants' saving itself means investment for capital formation”.

In the typical case, a worker obtains his or her wages, and some part of that income is spent on consumption, while the other part is saved for future needs. This saving behavior is a form of investment, and after several periods, the worker can accrue interest on the saved money. Therefore, we can consider that labor inflows are also the inflows of the capital owner or investor. The pioneering study of Rodorigues (1975) applies the well-known overlapping generations model. The study of Galor (1986) is also an important study, given its unique conclusion: the economic welfare of the host country will decrease, while that of the source country remains unchanged. This conclusion runs contrary to the ordinary results from static analyses that involve an extended HOS model. We can find several extension studies, such as those of Kemp and Kondo (1989), Karayalcin (1994), Galor and Stark (1987, 1990), Kondo (1990), and Schaeffer (1995).

#### ***1.2.5 Diversity in Quality of Workers***

“Quality of workers are not uniform; namely some workers are skilled and with high productivity but others are not.”

Among immigrants, as with domestic workers, some are skilled while others are not. Skill and education gaps surely give rise to differences in productivity and loyalty

First, optimal selection of good quality workers must be considered. Chiswick (1978), Carliner (1980) and Borjas (1985, 1987, 1991) focused on the self-selection problem. Especially, Borjas (1991) showed that there is self-selection in what kinds of people will leave any given country, in terms of both observable characteristics (e.g., education) and unobservable characteristics (e.g., ability and level of productivity). In other words, many educated persons will tend to migrate to the United States (i.e., positive selection in terms of education), but within the population of highly educated persons, the least-productive persons will migrate (i.e., negative selection in terms of unobserved characteristics). Clark et al. (2007) considered four types of migration costs—namely, individual-specific migration costs, direct costs, migration costs that result from quantitative restrictions on immigration, and migration costs resulting from

skill-selective immigration policy. They extended the model of Borjas (1991) to account for the effects of the nonpecuniary costs of migration and explicit immigration restrictions. Urrita (1998) studied the effect of migration cost on the self-selection of immigrants, by using a dynamic general equilibrium framework. Grogger and Hanson (2011) also studied two prominent features of international labor movements—namely, positive selection, which implies that more highly educated individuals are more likely to emigrate, and positive sorting, which implies that more highly educated migrants are more likely to settle in destination countries that heavily reward skills.

On the other hand, selection by the host country is also an important topic. Most of the developed countries like Japan and South Korea welcome highly skilled workers but restrict the inflow of unskilled workers. Djajic (1989) focused on this topic and established the theoretical model of legal workers' immigration with requisite skill level. Kondoh (2000) considered the possibility of illegal unskilled workers immigration while Shimada (2004) also consider co-existence case of both skilled and unskilled immigrants and analyzed the political effects of changing legal minimum wage rate.

Second, it is not always easy for employers to distinguish the real skill level of immigrants. Studies that focus on this asymmetric information problem include, for example, those of Katz and Stark (1984, 1986, 1987), Kwok and Leland (1982, 1984), Stark (1991), and Shimada (2009).

Third, we need to mention the “brain drain” problem. In medium-developed countries, highly skilled workers whose education is at least partially underwritten by public funding tend to migrate to highly developed countries, which tend to supply better job opportunities. This represents a great loss to those source countries, and many studies on international migration focused on this topic as early as in the 1970s; these include the studies of Bhagwati and Hamada (1974, 1982) and Bhagwati and Rodriguez (1975). Kwok and Leland (1982), Lien (1987), Miyagiwa (1991), Beine et al. (2001, 2008), and Dustmann et al. (2011) are extension studies.

Fourth, some studies focus on aspects of human capital accumulation, such that workers themselves can improve their skills through their own efforts. The study of Sjaastad (1962) is a pioneering work that focused on the fact that migration is an act wherein one moves one's skills to the market that offers the highest return. By considering the various conditions of skill formation among workers—where, in the typical case, a worker's skill accumulation is comparatively easier in his or her home country—Djajic (1985) undertook comparative static analysis of skilled and unskilled labor markets. In that study, he determines the constitution of two types of labor, the prices of goods, and factors in equilibrium. Wong (1995) proposes an economic model of

overlapping generations, for international migration that involves skill formation that occurs through “learning by doing.”

Fifth, quality differences between domestic workers and immigrants tend to raise the social topic of assimilation. Empirical studies by Chiswick (1978, 1979) present a positive assimilation model, where an increase in earnings over a period is attributable to skill and information acquisition. On the other hand, Chiswick and Miller (2011) present the negative assimilation model, where a decline in earnings is attributable to a decline in the economic rent that stimulated the initial migration. Chiswick and Miller (2012) generalize these two aforementioned models.

### ***1.2.6 Negative Effects on Natives***

“Immigration implies labor inflow of human beings with different background of cultures, thus it causes negative externalities on the society of the host country. Moreover, even though aggregate positive economic effects on production or GDP occur, some workers who are easily substituted by immigrants will lose from immigration. Therefore the inflow of workers, especially unskilled ones, is sometimes prohibited by the government of the host country.”

The economic effects of two possible forms of restriction policy on illegal immigrants—namely, border enforcement and internal enforcement—were studied by Ethier (1986). According to the findings of Ethier (1986), the economic welfare of the small host country will not be improved by establishing border enforcement policy: the reasons are that such policy will enhance both restriction costs and the wage rate that is applied to illegal workers. Bond and Chen (1987) adopted a two-country model to study the effects of internal enforcement policy on the economic welfare of the host country. Ohta (1990) surveyed these two aforementioned studies and shows that it is not easy to enhance the domestic income of the host country merely by restricting illegal immigrants, but that internal enforcement policy is nonetheless relatively better than border enforcement. The studies of Yoshida (1993, 1996, 2000), Yoshida and Woodland (2005), and Woodland and Yoshida (2006) are extension studies of Bond and Chen (1987), who considered global welfare while introducing the factor of capital mobility and relaxing risk neutrality. Finally, Cobb-Clark et al. (1995) studied the effect of the IRCA, a kind of internal enforcement policy by which to control illegal immigrants into the United States, chiefly by imposing fines on employers who employ unauthorized workers.

Djajic (1989) considered a realistic model, wherein only lower-skilled holders were

restricted. Each individual can improve his or her skills and, depending on his or her innate abilities and after investing several periods in skill formation, he or she can finally obtain the skills needed to become a legal migrant. As it takes quite some time for a lower-ability worker to become sufficiently skilled, he or she may lose the opportunity to migrate legally: after migration, he or she could earn much money, but not enough time would remain before retirement for him or her to save sufficient money to recoup the costs, and so it will not fully cover the costs of the related education and trips. Thus, in this model, both the lowest-ability workers who in reality decide to become legal migrants and their staying period in the host country are determined simultaneously. Kondoh (2000) extended the study of Djajic (1989) and considered an alternative means of migration: lower-ability workers who are not allowed to be legal migrants will tend to become illegal migrants. In such a situation—where relatively high-potential legal immigrants and low-potential illegal immigrants coexist—and with the probability that the acquisition of the higher-level skills required for legal immigration might enhance entrance among illegal foreign workers, Kondoh (2000) studied the effects of qualitative and quantitative restriction policies on international immigration.

As an example of dynamic models, Klein and Ventura (2009) studied the interaction between differences in total factor productivity and barriers to labor mobility. They used a growth model with endogenous labor movements to quantitatively assess the effects on output, capital accumulation, and the welfare of removing barriers to labor mobility. On the other hand, Guzman et al. (2008) studied the effects of technological progress in a smuggling industry—something that surely has positive effects on the behavior of disguising illegal immigrants.

### ***1.2.7 The Second Mobile Factor***

“In cases where both capital and labor are internationally mobile, by combining two political methods, we can consider various strategies toward factor movements.”

Surely, in one sense, it is thought to be possible to treat the mobility of capital and labor quite similarly, as two essential production factors. However, under the possibility that both factors are independently mobile, we can also consider the well-known classic subjects of choice, permission with respect to one of two movements, capital outflows, or labor inflow. There is a rich research history on this topic, following the pioneering work of Ramaswami (1968)—a study that made the famous proposition, that is the optimally controlled import of a relatively scarce factor is preferable to the optimally controlled

export of a relatively abundant factor. Several detailed and accurate extension studies followed, including those of Webb (1970), Bhagwati (1979), Bhagwati and Srinivasan (1983), Calvo and Wellisz (1983), and Jones and Coelho (1985). Kuhn and Wooton (1987) studied the case of the existence of a fixed factor in a capital-abundant country. Brecher and Choudhri (1987) considered the possibility of unemployment. On the other hand, we have a series of extension studies by Ramaswami (1968) that focused on the strategic aspects of international factor movement. Jones et al. (1986) and Jones and Easton (1989) each discuss the optimality of buy-out policies. Jones et al. (1986) showed that if a country were to buy all of the factors owned by another country at the current factor price, the buyer could enjoy all the profits that arise from increased global output and income, even as the seller's income remains unchanged. Additionally, Jones and Easton (1989) showed that even though there exist technology gaps among countries, buy-out policies are still optimal for any country with low-level technology holdings. On the other hand, Cheng and Wong (1990) analyzed a noncooperative game in which two countries adopt optimal restriction policies simultaneously and thus maximize their respective welfare. In this case, unlike the case in the classic study of Ramaswami (1968), both countries prefer exports of a relatively abundant factor to imports of a relatively scarce factor. Moreover, Cheng and Wong (1997) conclude that a complete buy-out policy would not represent the Nash equilibrium for either country.

### ***1.2.8 Human Networks***

“Different from FDI, an existing human network of immigrants sometimes encourages additional labor flow. On the other hand, immigration may cause hostile reactions by a labor union, which can be considered as another human network”.

Carrington et al. (1996) studied a dynamic model of labor migration, in which moving costs decrease as the number of networking migrants already settled in the destination increases. Additionally, McKenzie and Rapoport (2007) focused on the relationship between inequality of workers in the host country and immigrants' networks. Initially, only members of the middle class have both the means and incentives to migrate, and this increases inequality in the source country. However, the migration networks that do form lower the costs incurred by future migrants, which in turn lowers inequality.

Generally speaking, the labor union of a host country tends to be against immigrants, as their presence tends to reduce the competitive wage rate or enhance the unemployment rate. Kemp et al. (1991) studied the effects on the Cournot–Nash

equilibria of the host and source countries, with labor unions created by international capital and labor movement. They focus on cooperation among the labor unions of both of the countries involved. Zhao and Kondoh (2006) considered the economy of the host country, where only skilled workers are unionized; they studied the effects of the permanent and temporary international immigration of skilled and unskilled workers.

### **1.3 Summary of This Text**

This text comprises four parts. Part I is devoted to the basic theoretical study of international immigration; it focuses on the economic effects of immigration on the host country. This part helps introduce readers to benchmark models and common understandings of migration theory. In Part II, we direct our attention to the labor market of the host country of international immigration; there, we consider the role of labor unions and voluntary unemployment. The effects of international immigration on the natural environment are studied in Part III; especially, we pay attention to trans-boundary environmental pollution that is mainly caused by developing countries that have lower pollution abatement technologies. Immigration from such developing countries implies changes in the magnitude of smokestack production in both the host and source countries. The studies explored in Part IV relate to recent trends in economic integration. By expanding free trade agreement/EPA networks, several new aspects of international immigration have given rise to a trove of untouched research subjects, such as optimal introduction policies regarding technical intern training programs; optimal economic policies regarding the international labor flows of midstream countries that simultaneously export and import workers; and gains that derive from economic integration between countries with heterogeneous immigration policies.

#### ***1.3.1 Part I: International Migration and the Economy of the Host Country***

In Chapter 2, as an extension of the studies mentioned in section 1.2.2, we focus on the effects of immigrants' remittances. Using a two-factor, two-good model—where only one of the goods is nontradable—we investigate the effects of immigration on the relative prices of the two goods, the wage rate, and the rental price. We also demonstrate that an inflow of foreign workers gives rise to an increase in the welfare of the native inhabitants in the host country, and if the nontraded good is capital (labor) intensive, an inflow of permanent migrants without remittance is of greater (less) benefit to the native inhabitants than an inflow of cross-border workers who remit all of their income.

In Chapter 3, while considering the properties of immigration mentioned in sections 1.2.3 and 1.2.6, we focus on selective immigration restriction policies that prohibit the entrance of workers who lack the requisite skills. By considering the optimal behavior of illegal immigrants who must confront the various enforcement techniques adopted by the host country, we show that an increase in penalties, in travel cost, or in the possibility of detection would be effective in creating qualitative objectives but not quantitative ones. Moreover, when a host country starts to accept skilled legal migrants, if the required skill level is relatively low and the possibility of detection is sufficiently high, an increase in penalties will be effective for both objectives.

### ***1.3.2 Part II: International Immigration and the Labor Market***

In Chapter 4, we focus on the realistic labor market of contemporary developed countries and establish a model that features legal and illegal immigrants, shirking, and voluntary unemployment, as mentioned in section 1.2.1. In developed countries, some native workers are unemployed while there exist illegal unskilled (legal skilled) foreign workers who are complementary to (substitutable for) natives, and their wages are usually lower than (equal to) those of natives. Reflecting this situation, we introduce two types of immigrant in an efficiency wage model. We show that the domestic government should exclude illegal foreign workers but welcome legal ones if the total number of illegal immigrants were sufficiently small and effectively controlled. On the other hand, legal immigration should be restricted if the flood of illegal immigration is out of control.

In Chapter 5, we focus on the role of labor unions with regards to permanent and temporary immigrants who may harm the profits of domestic workers. We investigate permanent and temporary immigration and remittance under the coexistence of unionized and nonunionized manufacturing firms in a two-sector economy. The impacts of immigration and remittance on each of wages, employment, the union–nonunion wage gap, and national welfare are analyzed. We find that both permanent immigration (economy-wide) and temporary immigration in agriculture have positive effects on most variables (except the competitive wage), but widens the wage gap and causes income redistribution in the host country. However, if temporary immigrants work only in manufacturing, then all wages and the union–nonunion wage gap will shrink—that is, workers will become more equally paid, but poorer. In addition, remittance and globalization have negative effects on union workers and employers. It is perhaps such consequences, as well as the income redistribution effect of immigration, that cause the



media to paint a negative image of immigration.

In Chapter 6, our focus turns to repeat migration (i.e., workers who pass through borders again and again during their lifetime). Taking into consideration the possibility of repeat migration as the optimal behavior of skilled workers and a manifestation of the ability/skills differential of potential immigrants, we analyze the effects of qualitative restriction policies on immigration. For the host country, the two main objectives in implementing these policies are to exclude workers that have low working spirits and lower-potential ability. We show that neither well-controlled travel costs nor capital mobility can simultaneously achieve these two targets, but that controlling minimum skill requirements can successfully achieve both targets.

### ***1.3.3 Part III: International Immigration and the Natural Environment***

In Chapter 7, we focus on trans-boundary pollution that originates in those developing countries that possess poor pollution-abatement technology—pollution that hence has negative externalities on the economies of neighboring developed countries. We analyze the welfare effects of international migration, given the existence of trans-boundary pollution. We use a simplified Copeland and Taylor (1999) model, where the developed Home country has pollution-abatement technology superior to that of the under-developed Foreign country. If there is no trade, workers will migrate from the Foreign country to the Home country. The Foreign country gains from migration, but whether or not the Home country gains depends on the technology gap between the two countries and the magnitude of trans-boundary pollution. Total World welfare will increase under migration, and if a free-trade equilibrium exists, international migration will occur when the Home country specializes in the production of an agricultural good. Migration will expand production of the manufactured good and reduce the level of World pollution.

In Chapter 8, we again focus on the effects of international migration, under the negative externality of trans-boundary pollution; however, here we additionally analyze the economic effects of international “brain drain” migration. In autarky, both skilled and unskilled workers are expected to migrate from a less-developed foreign country to the developed home country, if permitted. Surprisingly, under certain conditions, all workers—other than skilled foreign workers—will gain (lose) from the migration of unskilled (skilled) foreign workers. Moreover, if skilled foreign workers are employed as unskilled domestic workers, then skilled foreign workers will gain, but unskilled workers in both countries will lose. Whether or not skilled domestic workers will gain

depends on the magnitude of the pollution spillover parameter. “Brain drain” migration persists under free trade if the demand for manufactured goods is strong.

In Chapter 9, we introduce the environmental industry, which supplies the pollution-abatement equipment used in our model in Chapter 7. We find that the real wage rate will be higher in the developed country with a higher level of productivity in producing pollution-abatement equipment (or which otherwise has superior pollution-abatement technology). On the other hand, the effects of environmental tax policies on the real wage rate are not clear. Given permission for international migration, we can assert that in at least one of the two countries involved—namely, the host or source country—migration will have positive effects on the wage rate, environment stock, and economic welfare of the representative worker. Moreover, under a certain simple condition, we show that both countries could gain from international migration.

In Chapter 10, we consider the real-world aspect of an urban area in a developed country, and the existence of involuntary unemployment caused by a fixed relative high wage rate. We investigate the effects of an increase in emission tax, a decrease in the fixed manufacturing wage rate, and an increased inflow of foreign workers on the competitive wages, environment stock, and economic welfare of the representative consumer, as well as employment in the presence of a pollution-abatement equipment sector and unemployment. Our main findings are that an increase in emission tax and a decrease in the urban minimum wage rate will reduce unemployment, and international immigration may increase the competitive wage rate, employment rate, environmental-capital stock, and economic welfare of the representative worker.

In Chapter 11, unlike the previous chapters, we focus on border-free accessible renewable resources, such as ocean-based fish and seafood. Similar to the previous chapters, we develop a two-country model with two industries. We show that if the marginal harvest of the resource industry in the home country is lower than the marginal damage of manufacturing—while it is higher in the foreign country—migration will still have positive effects on the stock of renewable resources, and this should improve welfare in both countries.

#### ***1.3.4 Part IV: International Immigration and Economic Integration***

In Chapter 12, we investigate the welfare effects of developed countries that have heterogeneous and uncoordinated immigration policies. We build a simple three-country model where two rich countries with different immigration policies receive immigrants from a third, developing country. We consider the effects of economic integration in the

form of the free mobility of native workers: we show that under certain conditions, the wage gap between the two developed countries is crucial, whether the integration outcome is win–win or lose–lose.

In Chapter 13, we theoretically investigate the economy of a small country that exports skilled labor to more-developed countries and simultaneously imports unskilled labor from less-developed countries. Compared to the free immigration case, if this country adopts an optimally controlled immigration policy by imposing an income tax on immigrants that maximizes national income, skills formation will be negatively affected and the number of domestic unskilled workers will increase. Moreover, under certain conditions, we can assert the counter-intuitive possibility that the wage rate of domestic unskilled workers may decrease, but that that of skilled workers may increase, owing to the restriction on foreign unskilled workers.

In Chapter 14, from the perspective of a shrinking population in a developed country such as Japan, we analyze the effectiveness of various economic policies by which to secure a sufficient amount of qualified workers, chiefly by introducing foreign unskilled workers and training them so that they may acquire skills. We find that under certain conditions, the government must announce only the required period of skill training, while the total number of skilled trainees must be considered endogenously given. Then, policies that would bring about a change in the required period, encourage capital outflow, or increase the penalty charge for illegal immigration may become more effective. On the other hand, announcements vis-à-vis the total number of skilled trainees cannot help attain the aforementioned political targets.

Chapter 15 addresses the future possible case of Asia; in this chapter, we study recent European trends with regards to illegal migrants. Initially, they cross the border of marginal countries (e.g., Greece or Italy) of a large economic block (i.e., the European Union), with the intention of moving within the block to find good job opportunities in more developed country (e.g., Germany); this is facilitated by a lack of any passport control among member countries. Especially, we focus on the optimal internal enforcement restriction policies of Germany, a highly developed country, as a final destination of immigrants from two different routes (i.e., via Italy with border control, or via Greece without any restriction). We found that under certain conditions, surprisingly, German restriction enforcement should be reduced if immigration via Greece were to increase.

## References

- 2013 Yearbook of Immigration Statistics*, office of immigration statistics, U. S. Homeland Security.
- 2015 Immigration Control*, Ministry of Justice, Japan.
- Akerlof, G. A., & Yellen, J. L. (1990). The fair wage-effort hypothesis and unemployment. *Quarterly Journal of Economics*, 105, 255-283.
- Battisti, M., Felbermayr, G., Peri, G., & Poutvaara, P. (2014). Immigration, search frictions and redistribution: A quantitative welfare analysis. *NBER Working Paper* No. 20131.
- Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: Theory and evidence. *Journal of Development Economics*, 64, 275-289.
- Beine, M., Docquier, F., & Rapoport, H. (2008). Brain drain and human capital formation in developing countries: Winners and losers. *Economic Journal*, 118, 631-652.
- Bhagwati, J. N. (1979). International factor movements and national advantage. *Indian Economic Review*, 14, 3-30.
- Bhagwati, J. N., & Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment: A theoretical analysis. *Journal of Development Economics*, 1, 19-24.
- Bhagwati, J. N., & Hamada, K. (1982). Tax policy in the presence of emigration. *Journal of Public Economics*, 18, 291-317.
- Bhagwati, J. N., & Rodriguez, C. A. (1975). Welfare-theoretical analysis of brain drain. *Journal of Development Economics*, 2, 195-221.
- Bhagwati, J. N., & Srinivasan, T. N. (1983). On the choice between capital and labor mobility. *Journal of International Economics*, 14, 209-221.
- Bodvarsson, O. B., & Van den Berg, H. (2009) *The Economics of Immigration: Theory and Policy*. Springer-Verlag.
- Bodvarsson, O. B., Simpson, N. B., and Sparber, C. (2015). Migration Theory. In B. R. Chiswick & P. W. Miller, *Handbook of the Economics of International Migration, 1A the Immigrants*, North-Holland.
- Bond, E. W., & Chen, T. J. (1987). The welfare effects of illegal immigration. *Journal of International Economics*, 23, 315-328.
- Borjas, G. J. (1985). Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics*, 3, 463-489.
- Borjas, G. J. (1987). Self-selection and the earnings of immigrants. *American Economic Review*, 77, 531-553.

- Borjas, G. J. (1991). Immigration and self-selection. In J. M. Abowd, & R. B. Freeman, (Eds.), *Immigration, Trade, and the Labor Market*, Chicago Press.
- Borjas, G. J. (1994). The Economics of Immigration. *Journal of Economic Literature*, 32, 1667-1717.
- Brecher, R. A., & Choudhri, E. U. (1987). International migration versus foreign investment in the presence of unemployment. *Journal of International Economics*, 23, 329-342.
- Bricks, J. S., & Sinclair, C. A. (1980). *International migration and development in the Arab region*. ILO.
- Calvo, G., & Wellisz, S. (1983). International factor mobility and the national advantage. *Journal of International Economics*, 14, 103-114.
- Carliner, G. (1980). Wages, earnings, and hours of first, second, and third generation American males. *Economic Inquiry*, 18, 87-102.
- Carrington, W. J., Detragiache, E., & Vishwanath, T. (1996). Migration with endogenous moving costs. *American Economic Review*, 86, 909-930.
- Cheng, L. K., & Wong, K. Y. (1990). On the strategic choice between capital and labor mobility. *Journal of Regional Science*, 37, 35-54.
- Cheng, L. K., & Wong, K. Y. (1997). Strategic policies toward international factor movement. *Canadian Journal of Economics*, 30, 456-478.
- Chiswick, B. R. (1978). The effect of Americanization on earnings of foreign-born men. *Journal of Political Economy*, 86, 897-921.
- Chiswick, B. R. (1979). The economic progress of Immigrants: Some apparently universal pattern. In W. Fellner (Eds.) *Contemporary Economic Problems*, Washington, American Enterprise Institute, 357-399.
- Chiswick, B. R., & Miller, P. W. (2011). The 'negative' assimilation of immigrants: A special case. *Industrial and Labor Relations Review*, 64, 502-525.
- Chiswick, B. R., & Miller, P. W. (2012). Negative and positive assimilation, skill transferability, and linguistic distance. *Journal of Human Capital*, 6, 35-55.
- Cobb-Clark, D. A., Shiells, C. R., & Lowell, B. L. (1995). Immigration reform: The effects of employer sanctions and Legalization on wages. *Journal of Labor Economics*, 13, 472-498.
- Diamond, P. A. (1982). Wage determination and efficiency in search equilibrium. *Review of Economic Studies*, 49, 217-227.
- Diamond, P. A. (2011). Unemployment, vacancies, wages. *American Economic Review*, 101, 1045-1072.
- Djajic S. (1985). Human capital, minimum wage and unemployment: A Harris-Todaro

- model of a developed open economy. *Economica*, 52, 491-508.
- Djajic, S. (1987). Illegal aliens, unemployment and immigration policy, *Journal of Development Economics*, 21, 1987, 235-249.
- Djajic, S. (1989). Skills and the pattern of migration: The role of qualitative and quantitative restrictions on international labor mobility. *International Economic Review*, 30, 795-809.
- Djajic, S., & Milbourne, R. (1988). A general equilibrium model of guest-worker migration: The source country perspective. *Journal of International Economics*, 25, 335-351.
- Dustmann, C. (1995). Savings behavior of return migrants. *Zeitschrift fuer Wirtschafts und Socialwissenschaften*, 115, 511-535.
- Dustmann, C. (1997). Return migration, uncertainty and precautionary savings, *Journal of Development Economics*, 52, 295-316.
- Dustmann, C. (1999). Temporary migration, human capital, and language fluency of migrants. *Scandinavian Journal of Economics*, 101, 297-314.
- Dustmann, C. (2003). Return migration, wage differentials, and the optimal migration duration. *European Economic Review*, 47, 353-369.
- Dustmann, C. (2008). Return migration, investment in children, and intergenerational mobility. *Journal of Human Resources*, 43, 299-324.
- Dustmann, C., & Kirchkamp, O. (2002). The optimal migration duration and activity choice after re-migration. *Journal of Development Economics*, 37, 351-372.
- Dustmann, C. and Weiss, Y. (2007). Return migration: Theory and empirical evidence from the UK. *British Journal of Industrial Relations*, 45, 236-256.
- Dustmann, C. and Mestres, J. (2011). Savings, asset holdings, and temporary migration. *Annales d'Economie et de Statistique*, 97/98, 289-306.
- Dustmann, C., Fadlon, I., & Weiss, Y. (2011). Return migration, human capital accumulation and the brain drain. *Journal of Development Economics*, 95, 58-67.
- Ethier, W. J. (1985). International trade and labor migration. *American Economic Review*, 75, 691-707.
- Ethier, W. J. (1986). Illegal immigration: The host country problem. *American Economic Review*, 76, 56-71.
- Galor, O. (1986). Time preference and international labor migration. *Journal of Economic Theory*, 38, 1-20.
- Galor, O., & Stark, O. (1987). The impact of Differences in the levels of technology on international migration. *Discussion Paper 34, Center for Population Studies, Harvard University*.

- Galor, O., & Stark, O. (1990). Migrants' savings, the probability of return migration and migrants' performance. *International Economic Review*, 31, 463-467.
- Guzman, M. G., Haslag, J. H., & Orrenius, P. M. (2008). On the determinants of optimal border enforcement. *Economic Theory*, 34, 261-296.
- Graves, P. E., & Linneman, P. (1979). Household migration: Theoretical and empirical result. *Journal of Urban Economics*, 6, 383-404.
- Grogger, J., & Hanson, G. H. (2011). Income maximization and the selection and sorting of international migrants. *Journal of Development Economics*, 95, 42-57.
- Harris, J. R., & Todaro, M. (1970). Migration, unemployment and development: A two sector analysis. *American Economic Review*, 60, 126-142.
- Hill, J. K. (1987). Immigration decisions concerning duration of stay and migration frequency. *Journal of Development Economics*, 25, 221-234.
- International Migration Outlook 2012*, OECD.
- International Migration Report 2015*. United Nations.
- Jones, R. W. (1967). International capital movements: The theory of tariffs and trade. *Quarterly Journal of Economics*, 81, 1-38.
- Jones, R. W., & Coelho, I. (1985). International factor movements and the Ramaswami argument. *Economica*, 52, 359-364.
- Jones, R. W., Coelho, I., & Easton, S. T. (1986). The theory of international factor flows: The basic model. *Journal of International Economics*, 20, 313-327.
- Jones, R. W., & Easton, S. T. (1989). Perspectives on 'buy-out' and the Ramaswami effect. *Journal of International Economics*, 27, 363-371.
- Karayalcin, C. (1994). Temporary and permanent migration with and without an immobile factor. *Journal of Development Economics*, 43, 197-215.
- Kats, E., & Stark, O. (1984). Migration and asymmetric information: Comment. *American Economic Review*, 74, 533-534.
- Kats, E., & Stark, O. (1986). Labor mobility under asymmetric information with moving and signalling costs. *Economic Letters*, 21, 89-94.
- Kats, E., & Stark, O. (1986). Labor migration and risk aversion in less developed countries. *Journal of Labor Economics*, 4, 131-149.
- Kats, E., & Stark, O. (1987). International migration under asymmetric information. *The Economic Journal*, 97, 718-726.
- Kemp, M. C. (1966). The gains from international trade and investment: A neo-Heckscher-Ohlin approach. *American Economic Review*, 56, 788-809.
- Kemp, M. C., & Kondo, H. (1989). An analysis of international migration: The unilateral case. In K. F. Zimmermann, (Eds.), *Economic Theory of Optimal Population*,

Springer-Verlag.

Kemp, M. C., Long, N. V., & Shimomura, K. (1991). *Labor Unions and the Theory of International Trade*. North-Holland.

Klein, P., & Ventura, G. (2009). Productivity differences and the dynamic effects of labor movements. *Journal of Monetary Economics*, 56, 1059-1073.

Kondo, H. (1990). An analysis of guest-worker migration with endogenous fertility. *The Nanzan Journal of Economic Studies*, 4, 341-357.

Kondoh, K. (1999). Permanent migrants and cross-border workers: The effects on the host country. *Journal of Regional Science*, 39, 467-478.

Kondoh, K. (2000). Legal migration and illegal migration: The effectiveness of qualitative and quantitative restriction policies. *Journal of International Trade and Economic Development*, 9, 227-245.

Kondoh, K. (2006). The frequency of migration and optimal restriction policies. *Global Business and Economy Anthology*, 2006-1, 197-209.

Kuhn, P., & Wooton, I. (1987). International factor movements in the presence of a fixed factor. *Journal of International Economics*, 20, 123-140.

Kwok, P., & Leland, H. (1982). An economic model of the brain drain. *American Economic Review*, 72, 91-100.

Kwok, P., & Leland, H. (1984). Migration and asymmetric information: Reply. *American Economic Review*, 74, 535.

Lee, C. I. (2010). Can search-matching models explain migration and wage and unemployment gaps in developing economies? : A calibration approach. *Journal of Regional Science*, 50, 635-654.

Lien, D. H. D. (1987). Economic analysis of brain drain. *Journal of Development Economics*, 25, 33-43.

Lundahl, M. (1985). International migration, remittances and real incomes: Effects on the source country. *Scandinavian Journal of Economics*, 87, 647-657.

MacDougall, G. D. A. (1960). The benefits and costs of private investment from abroad: A theoretical approach. *Economic Record*, 26, 13-35.

Mckenzie, D., & Rapoport, H. (2007). Network effects and the dynamics of migration and inequality: Theory and evidence from Mexico. *Journal of Development Economics*, 84, 1-24.

Mincer, J. (1978). Family migration decisions. *Journal of Political Economy*, 86, 749-733.

Ministry of Health, Labor and Welfare, JAPAN. (2015). Introduction of nurse and care worker candidates from the Philippines, Vietnam and Indonesia (in Japanese).



- Miyagiwa, K. (1991). Scale economies in education and the brain drain problem. *International Economic Review*, 32, 743-759.
- Mortensen, D. T. (2011). Markets with search friction and the DMP model. *American Economic Review*, 101, 1073-1091.
- Mortensen, D. T., & Pissarids, C. A. (1994). Job creation and job destruction in the theory of unemployment. *Review of Economic Studies*, 61, 397-415.
- Mortensen, D. T., & Pissarids, C. A. (1999). Unemployment responses to 'skill-biased' technology shocks: The role of labor market policy. *Economic Journal*, 109, 242-265.
- Mueser, P. S. (1997). Two-way migration in a model with identical optimizing agents. *Journal of Regional Science*, 37, 395-409.
- Mundell, R. A. (1957). International trade and factor mobility. *American Economic Review*, 47, 321-335.
- Ohta, H. (1990, in Japanese). Illegal foreign workers and economic welfare. *Annals of Economics and Business, Kobe University*. 40, 141-159.
- Park, C., & Kim, M. S. (2007). Searching, matching and migration. *Annals of Regional Science*, 41, 105-124.
- Pissarides, C. A. (1985). Short-run equilibrium dynamics of unemployment, vacancies, and real wages. *American Economic Review*, 75, 676-690.
- Pissarides, C. A. (1992). Loss of skill during unemployment and the persistence of employment shocks. *Quarterly Journal of Economics*, 107, 1371-1391.
- Pissarides, C. A. (2000). *Equilibrium Unemployment Theory*, 2<sup>nd</sup> Edition. The MIT press.
- Pissarides, C. A. (2007). Unemployment and hours of work: The north Atlantic divide revisited. *International Economic Review*, 48, 1-36.
- Pissarides, C. A. (2011). Equilibrium in the labor market with search frictions. *American Economic Review*, 101, 1092-1105.
- Polachek, S., & Horvath, F. (1977). A life cycle approach to migration: Analysis of the perspicacious peregrinator. In R. Ehrenberg (Eds.), *Research in Labor Economics*, JAI Press, Greenwich,
- Quibria, M. G. (1988). A note on international migration, non-traded goods and economic welfare in the source country. *Journal of Development Economics*, 28, 377-387.
- Quibria, M. G. (1989). International migration and real wages: Is there any neo-classical ambiguity? *Journal of Development Economics*, 28, 177-183.
- Quibria, M. G. (1993). International migration, increasing returns, and real wages. *Canadian Journal of Economics*, 26, 457-468.
- Quibria, M. G., & Rivera-Batiz, F. L. (1989). International migration and real wages: A

- resolution note. *Journal of Development Economics*, 31, 193-194.
- Ramaswami, V. K. (1968). International factor movement and national advantage, *Economica*, 37, 309-310.
- Rivera-Batiz, F. L. (1982). International migration, non-traded goods and economic welfare in the source country. *Journal of Development Economics*, 11, 81-90.
- Rivera-Batiz, F. L. (1983). The economics of the 'to and fro' migrant: Some welfare theoretical considerations. *Scandinavian Journal of Economics*, 85, 403-413.
- Rivera-Batiz, F. L. (1983). Trade theory, distribution of income, and immigration. *American Economic Review*, 73, 183-187.
- Rivera-Batiz, F. L. (1984). International migration, non-traded goods and economic welfare in a two class economy. *Journal of Development Economics*, 16, 325-330.
- Rivera-Batiz, F. L. (1986). International migration, remittances and economic welfare in the source country. *Journal of Economic Studies*, 13, 3-19.
- Rivera-Batiz, F. L. (1989). The impact of international migration on real wages. *Journal of Development Economics*, 31, 185-192.
- Rodriguez, C. A. (1975). On the welfare aspects of international migration. *Journal of Political Economy*, 83, 1065-1072.
- Schaeffer, P. V. (1995). The work effort and the consumption of immigrants as a function of their assimilation. *International Economic Review*, 36, 625-642.
- Shapiro, C. & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *American Economic Review*, 74, 433-444.
- Shimada, A. (2004). Reducing the inflow of unskilled foreign workers. *South-Eastern Europe Journal of Economics*, 2, 85-96.
- Shimada, A. (2009, in Japanese). *The Analysis of Foreign Workers by Efficiency Wage Hypothesis*. Gogensha.
- Stark, O. (1984). Migration decision making: A Review article. *Journal of Development Economics*, 14, 251-259.
- Stark, O. (1991). *The Migration of Labor*, Blackwell.
- Stark, O., & Levhari, D. (1982). On migration and risk in LDCs. *Economic Development and Cultural Change*, 31, 191-196.
- Stark, O., & Taylor, J. (1989). Relative deprivation and international migration. *Demography*, 26, 1-14.
- Stark, O., & Taylor, J. (1991). Migration incentives, migration types: The role of relative deprivation. *Economic Journal*, 101, 63-78.
- Stark, O., & Yitzhaki, S. (1988). Labor migration as a response to relative deprivation/ *Journal of Population Economics*, 1, 57-70.

- Thompson, H. (1984). International migration, non-traded goods and economic welfare in the source country: A comment. *Journal of Development Economics*, 16, 321-324.
- Urrutia, C. (1998). On the self-selection of immigrants. *Mimeo*, Universidad Carlos III de Madrid.
- Webb, R. L. (1970). International factor movement and the national advantage: A comment. *Economica*, 37, 81-84.
- Wong, K. Y. (1995). *International Trade in Goods and Factor Mobility*. The MIT Press.
- Woodland, A., D. & Yoshida, C. (2006). Risk preference, immigration policy and illegal immigration. *Journal of Development Economics*, 81, 500-513.
- Yoshida, C. (1993). The global welfare of illegal immigration. *Indian Economic Review*, 28, 111-115.
- Yoshida, C. (1996). The global welfare of illegal immigration in the presence of capital mobility. *Journal of Economic Integration*, 11, 554-565.
- Yoshida, C. (2000). *Illegal Immigration and Economic Welfare*, Physica-Verlag Heidelberg.
- Yoshida, C., & Woodland, A. (2005). *The Economics of Illegal Immigration*. Palgrave Macmillan.
- Zhao, L., & Kondoh, K. (2007). Temporary and permanent immigrations under unionization. *Review of Development Economics*, 11, 346-358.