

Migration and competitiveness in science and engineering in Japan | NANA OISHI[♦]

Abstract

This article focuses on highly skilled migrants employed in science and engineering, especially the information and communication technology (ICT) sector. Despite the fact that Japan is the third largest economy in the world, and is known for cutting-edge science and technology, the percentage of foreign scientists and engineers employed in Japan is the lowest among major industrialized countries. Can Japan attract highly skilled professionals as global competition of talent grows more fierce and the population ages? The author concludes that Japanese corporations will have to introduce more global human resource practices such as diversity management policies and performance-based pay/promotion schemes, and that the government will have to further expand the new point system to provide more incentives for skilled foreigners to work in Japan. Improving Japanese universities' research and education capacity would also be necessary to attract top-level international students who are prospective highly skilled workers.

Keywords: ICT, highly skilled migration, global talent, competitiveness.

Introduction

Highly skilled migration has been emerging as a key policy agenda in Japan. Numerous government reports now acknowledge the importance of “global human resources” (*gurobaru jinzai*) and promote highly skilled migration (CFEP, 2007; METI, 2010; MEXT, 2012). This has been partly a belated response to the accelerating global competition for talent. Most industrialized countries and emerging economies have already been adopting various policy strategies since the 1990s to attract the best and brightest to enhance national competitiveness in global knowledge economy (Kuptsch and Pang, 2006; Shachar, 2006; Douglass and Edelman, 2009). The shrinking labour force¹ due to the low birth rate and population aging had already been a major concern in Japan, but the dearth of “global human resources” in the current labour market has become even more salient after the Great East Japan Earthquake on March 11, 2011 after which a large number of highly skilled migrants left the country.

In fact, Japan has been very open to the immigration of highly skilled professionals. The government has never imposed any numerical quota, occupational constraints, or labour market tests. Once a migrant professional obtains a job offer from a company in Japan, she/he can be granted a work permit almost automatically regardless of their occupation, as long as the salary level meets the minimum criteria set by the Ministry of Justice. Despite its popular

[♦] Nana Oishi, Associate Professor of Sociology, Faculty of Liberal Arts, Sophia University, 7-1 Kioi-Cho, Chiyoda-ku, Tokyo, 102-8554 Japan. E-mail: nana_oishi@sophia.ac.jp.

¹ Japan's labour force is estimated to fall by 46% between 2010 and 2060 (NIPSSR, 2012).



stereotype as being a “closed nation,” Japan’s immigration policy for highly skilled professionals is one of the most lenient among industrialized countries (Oishi, 2012). And yet, the percentage of international scientists and engineers is also the lowest among major industrialized countries (OECD 2008), and the science and engineering fields have been suffering from a shortage of qualified workers (IPA, 2012). Why is it that the world’s third largest economy with its high standing in competitiveness in science and technology has such a limited size of highly skilled migrants? What are the implications for the country?

This article will present an overview of highly skilled migration in Japan and its implications for the country’s competitiveness in science and technology, with a particular focus on the ICT sector. It will analyse the role that migrant professionals have been playing in the sector, the reason for their limited presence, and the long-term sustainability of the regional labour supply. It will also examine the potential impact of the government’s newly introduced “Point System for the Highly Skilled.”

Data and Methods

This research is based on my larger research project² highly skilled migration in Japan. It draws on various data such as government statistics and reports, surveys by international organizations and research institutes, and the author’s own surveys and interviews. The data from existing literature was also incorporated wherever appropriate. Qualitative interviews were conducted between 2008 and 2012 on two different groups: (1) highly skilled migrants who were residing and working in the Tokyo metropolitan area; and (2) key informants such as government officials and corporate managers. In total, 156 in-depth interviews were conducted on these groups by using a semi-structured questionnaire. Out of 156 respondents, 25 were working in science and engineering industries. Each interview took about one hour per respondent. Wherever necessary, follow-up interviews were conducted with some respondents to obtain more detailed information and examine the changes in their intentions over time.

Competitiveness in science and technology in Japan

Despite its decline in overall economic competitiveness,³ Japan still maintains its competitive edge in science and technology. It was ranked second in the world on its overall scientific infrastructure (IMD 2012:168). Table 1 shows some of the indices that indicate Japan’s strong competitiveness in science.

² The project is titled “Multiple Migration and Complex Transnationalism” funded by the Japan Society for the Promotion of Science for this project (Grant No. 21530552) which the author gratefully acknowledge.

³ Japan had been ranked the world’s most competitive nation from 1989 and 1993, but fell rapidly since the late 1990s. In 2012, it was ranked 27th out of 59 economies (IMD 2012).

Table 1. Japan's competitiveness in science

Index	IMD Ranking
The Number of Patents Granted	1
The Number of R&D Professionals	2
Scientific Infrastructure	2
R&D Expenditure (\$)	2
The Number of Scientific Publications	3

Source: IMD (2012)

The Sector Profile

Just as in many other countries, ICT⁴ has been one of the leading sectors in science and technology in Japan. The number of ICT-related corporations listed in the Tokyo Stock Exchange (TSE) was 182 in 2011, comprising the fourth-largest industry in Japan after retailing, electronics, and wholesale trade. The ICT sector encompasses a large number of small- and medium-sized corporations, the number of which exceeds 10,000 (JISA 2011). The combined sales reached 21.5 trillion yen⁵ (\$23 billion)⁶ in 2010. Approximately 70% of the sales originate from the software industry, comprising the largest revenue source within Japan's ICT industries (JISA 2011).

The ICT industry has also been a major magnet for the domestic labour force. The size of the ICT workforce has been expanding over the last few decades. According to the Labour Force Survey, there were almost two million workers in the ICT sector in 2011, comprising 3% of the total labour force in Japan (MIAC 2012a). The government agency estimates that the number of core ICT workers was 1.03 million in 2011 (IPA 2012:20).

Japan's competitiveness in human resources in science and technology has been rather mixed. Although Japan boasts the world's second-largest supply of R&D professionals in business and the third-largest supply of university graduates in science and engineering, the availability of highly skilled engineers has been perceived as rather limited (Table 2). Japan was ranked 18th on the

⁴ The definition of the ICT industry is rather complex. The Ministry of Economy, Trade, and Industry (METI) classifies three sectors (software, information processing, and Internet-related sectors) as the ICT industry (METI 2011a). On the other hand, the definition by the Ministry of Internal Affairs and Communications (MIC) includes broadcasting, audio-visual and text production industries as part of the ICT industry (MIC 2012a). This paper will mostly adopt the METI definition unless it is stated otherwise.

⁵ This data is based on the narrower definition of the ICT industry, which refers only to Internet, software, and system service industries. The sales data based on the broader definition (including broadcasting, film/video, publications) would be about twice as big – 41 trillion yen.

⁶ All financial figures in this paper are based on the exchange rate on February 14, 2013.

availability of “qualified engineers” and 19th on “the availability of IT skills”⁷ (IMD 2012). In fact, the labour shortage in qualified engineers has been a major challenge for this sector. Even when Japan was hit by the Lehman Shock in 2008, 76% of ICT companies answered that they were experiencing a labour shortage. In 2011, 65% of ICT companies were still experiencing a labour shortage (IPA, 2012:25).

This data reveals key concerns for the quality of ICT human resources in Japan. According to the IBM survey, it took three years for Japanese engineers to reach “Level 3” (defined as “skilled workforce”) in 50 skill components, while a half of those in the US and Israel were qualified for Level 3 at the time of their recruitment (*Nikkei Computer* 2002). Experts also point out that the Japanese education system has a limited capacity for training ICT professionals with business skills such as those for project management, customer-facing applications, and web development, compared to China and India (BSA 2011:23).

Table 2. Japan’s competitiveness in human resources in science and engineering

Index	IMD Ranking
Total Number of R&D Professionals in Business	2
% of University Degrees in Science & Engineering	3
Availability of Qualified Engineers	18
Availability of IT Skills	19

Source: IMD (2011)

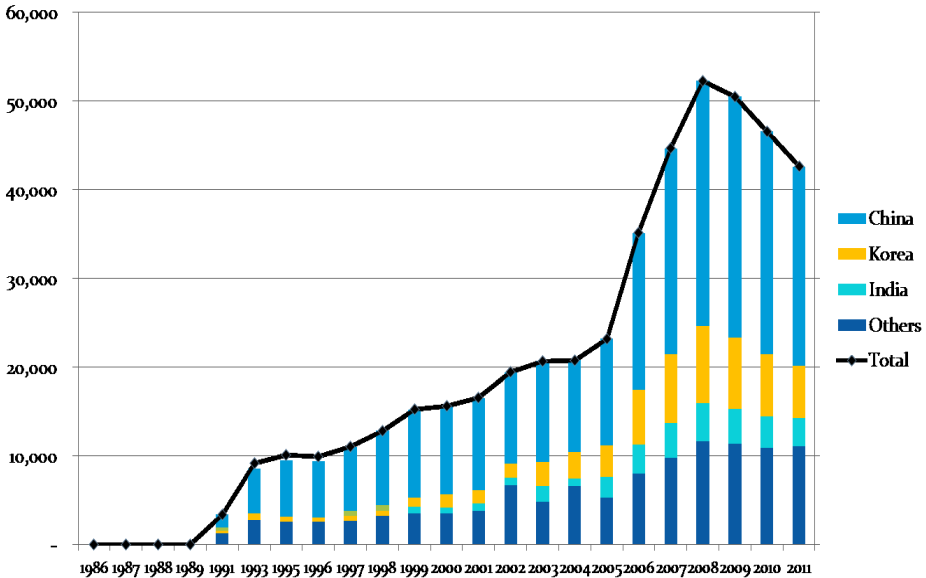
Migrants in science and engineering

Reflecting the dearth of qualified, highly skilled professionals in science and technology, an increasing number of Japanese corporations have been turning to other countries to fill the labour demand since the late 1990s. The number of migrant engineers more than quadrupled between 1998 and 2008. In 2011, there were 42,634 migrant engineers working in Japan, who comprised approximately 1.7 % of the total engineers in the country (MIC 2012b, MOJ 2012a). This figure is comparable with the demographic profile of migrants in Japan – 2.1 million migrants in Japan comprised 1.7 % of the country’s population in 2011 (MOJ 2012a). At the same time, given that migrants comprise only 1 % of Japan’s total labour force (MIC 2012b), engineers are slightly overrepresented. The typical migrant engineers are Asian males: 53% of them come from China, followed by Korea (14 %), India (7%), and Vietnam (6%).

⁷ These data are based on the Executive Opinion Survey on 4,935 executives in top and middle management in 59 economies worldwide.

The total number of migrant engineers, however, has been declining since the Lehman Shock (MOJ 2012a).

Figure 1. Migrant engineer inflows



Source: Ministry of Justice: Various years

Unfortunately, there is only the aggregate data available for migrant engineers and specialists in humanities/international services for age, residence, and workplace size. In terms of age, they are mostly young workers; 88% are in their 20s and 30s. The vast majority (84%) of them live in urban areas such as the greater Tokyo metropolitan area, Nagoya, Osaka, and Kobe where the ICT industry is concentrated. Their workplace tends to be small- or medium-sized; 73% of these workers are working for companies with less than 1,000 employees (MOJ 2012b).

As for earnings, 50% of migrant engineers earn less than 299,999 yen (\$3,200) and 20% earn 300,000-39,999 yen (\$3,200-\$4,300) per month. This may seem a bit low, but it is probably due to the fact that the majority (56%)⁸ of them are in their 20s (MOJ 2012b). Japanese corporations have a seniority-based pay scheme, and thus the earnings of young workers tend to be low. Even the average monthly income of Japanese engineers in their 20s is 300,000 yen (\$3,200).⁹ This data can be used as a point of reference, even though there is no data available to compare the earnings of migrants and Japanese engineers.

⁸ This percentage is again an aggregate figure for “engineers” and “specialists in humanities and international services.” There is no specific data on engineers only.

⁹ This is the author’s calculations based on the wage data (MIC 2012b)

State policy on migration in the ICT sector

The Japanese government has been actively promoting the immigration of ICT workers. In 2000, it proposed the Asian Common IT Skill Standards Initiative at the meeting of the ASEAN plus Three (Japan, China, and Korea) to develop a mutual skill recognition system for engineers. In the same year, Japan also joined the APEC Engineers Mutual Recognition Project and became one of the participants of the APEC Engineer Register, which certified the qualified engineers in the region. These initiatives signified the government's attempt to tap into a greater pool of engineers in the Asia-Pacific region (IPEJ, 2011). The subsequent "e-Japan Strategy II" set the goal of accepting 30,000 ICT professionals from overseas by 2005 (Cabinet Office 2003). It declared it would relax immigration policies to facilitate the inflow of software engineers from other countries.

In 2010, the Prime Minister Naoto Kan declared the New Growth Strategy, including a plan to double the number of highly skilled migrants and increasing international students, believing that attracting global talent would be crucial for economic growth in the knowledge economy (Cabinet Office 2010). This strategic line remained intact in following administrations. The "Rebirth of Japan: A Comprehensive Strategy," which was adopted in July 2012, set the goal of doubling the number of highly skilled migrants by 2020 (Cabinet Office 2012:47). Other goals also included increasing the ratio of international scholars in Japanese research institutions to 15% by 2015, and tripling the number of top international scholars in Japan by 2020 (Cabinet Office 2012:81-82).

Why so few migrant engineers?¹⁰

Whether the new Prime Minister Abe will follow the same path remains to be seen. However, what we need to examine here is why migrant engineers comprise only 1.7% of the total engineer population in Japan, despite its open immigration policies for highly skilled professionals. I have explained elsewhere that there was only so much the government could do – it could prepare a favourable environment, but the market force is much more powerful in determining the levels of labour supply and demand (Oishi, 2012). Indeed, there are both supply related and demand related factors that explain the low level of engineers and IT professionals in Japan.

(1) Demand Related Factors

On the demand side, a limited number of corporations in Japan are willing to employ foreigners. According to a survey in 2008, 40% of large-scale Japanese corporations had never hired highly skilled migrants (MHLW 2008). Another study also revealed that only 10% of major Japanese corporations had hired former international students who graduated from Japanese universities (JILPT 2009). Many corporations have been hesitant to employ migrants out

¹⁰ This section is based on my research published elsewhere (Oishi, 2012).

of concern for their communication ability in the Japanese language as well as high turnover rates. The language-based communication problems are quite a challenge for many human resources directors because they find it difficult to fairly assess a worker's skills, and also because of worries that their clients might get upset with the low ability in Japanese of the migrant staff. Furthermore, the ideology of lifetime employment still remains resilient among Japanese corporations. Although most companies can no longer guarantee lifetime employment, they expect their employees to stay loyal to them. During my fieldwork, some directors of human resource departments complained that the majority of their foreign employees left within five years. Very few workers stay in Japan for 10 years or more, which would incur great loss in training investments and costs of hiring new employees.

The situation has been gradually changing in recent years due to the accelerating economic competition with other countries, and the greater need for global professionals with diverse perspectives. The year 2010 was called "the starting year of the global recruitment era" (*gurobaru saiyo gannen*), reflecting the sudden increase in corporations expanding the recruitment of foreign professionals in Japan as well as for their overseas subsidiaries (*Nikkei Shimbun*, 2011). Nevertheless, such a trend is mostly limited to large corporations. One survey revealed that while 78.5% of very large corporations (with 5,000-plus employees) had foreign employees in 2011, only 12.5% of medium-sized (100 to 300), and 6% of small (less than 100) corporations gave such an answer. On the whole, companies with foreign employees comprised only a minority – 17.5% of 351 corporations surveyed (HRI 2011). According to the government survey, only 4% of the employers of foreign workers were ICT corporations (MHLW 2012a).

(2) *Supply Related Factors*

Challenges exist on the supply side as well. There has been only a limited supply of highly skilled engineers who could speak Japanese. The vast majority of Japanese companies operate mostly in Japanese and those that adopt English as their working language remain exceptions. In such a situation, it is difficult for overseas engineers or ICT professionals to directly apply for jobs if they live outside Japan. Even international students who graduate from Japanese universities often find it difficult to reach the native proficiency level required by Japanese corporations. In other words, the available pool of potential work force for Japanese companies is quite small.

Another important point is that Japan itself has been losing its attractiveness for the global workforce. Out of 59 countries, Japan was ranked 48th on attractiveness to foreign high-skilled people, and 25th to researchers and scientists – below many Asian countries such as China, Korea, and Singapore (IMD 2012). My field research indicated that there were six reasons why highly skilled migrants were not attracted to Japan. First, even putting aside the language issue, the remuneration packages offered by Japanese corporations are not very attractive to foreign engineers. The starting salary for engineers is

approximately 205,000 yen (\$2,200) a month, which is the same for humanity majors. In the US, the average starting salary for engineers is more than twice as high (\$5,000), and is significantly higher than those with other degrees (USDOL 2011). Some of my respondents commented that Japanese salary packages were even less attractive than those in some other Asian countries due to the fact that Japanese salary schemes are based on seniority, and thus the salaries for young employees are kept quite low, regardless of their skill levels. The promotion system also carries the legacy of seniority-based lifetime employment rather than meritocracy, which drives many competent young professionals out of Japan.

Second, Japanese workplaces have been notorious for lacking work-life balance. Japan is ranked the third worst country on work-life balance (next to Mexico and Turkey) among 34 OECD member countries (OECD, 2012). Although the labour statistics show that the Japanese do not work as many hours as before, many small- and medium-sized companies require their employees to do “service overtime” – unpaid overtime work. Many migrant engineers whom I interviewed complained that they did not have enough time to learn Japanese and/or to make Japanese friends since they get so tired from long work hours and thus spend their weekends mostly sleeping.

Third, many female respondents showed their concern about the low status of women in their workplace. They felt that a “glass ceiling” problem was much more serious in Japan than in other countries. Although none of them (except one female engineer who experienced sexual harassment) had a direct experience of differential treatment between men and women, they felt that corporate culture in Japan was more male dominant than that in their home countries. The lack of female role models in corporate management also made them pessimistic about their future career. Most female respondents were planning to leave their current workplace because of their perceived limits in women’s career opportunities in Japan.

The lack of role models was not limited to women but was also felt among foreign male professionals – the lack of non-Japanese workers in management positions. My respondents expressed their concerns that they might not get promoted as fast as their Japanese colleagues. Although most human resource directors in leading Japanese corporations explained that they would never discriminate against foreigners, the fact that there are very few foreigners in management did not seem convincing to foreign professionals.

Fourth, the inflexibility of Japanese labour market was another major obstacle. In Japan where most recruitment takes place right after college graduation and job hopping is not too common yet, changing jobs after the age of 35-40 becomes quite difficult, if not impossible. Many migrant engineers and other highly skilled migrants expressed their worries that if they lose their job after the age of 40, they would suffer from dual discrimination – age discrimination as well as discrimination against foreigners. Such labour market inflexi-

bility and xenophobic environments discourage many highly skilled migrants from permanent settlement in Japan.

Fifth, social integration of family members was a crucial factor. In particular, children's education was the most important reason behind the decision of highly skilled migrants to leave Japan. Except for a limited number of top executives in multinational corporations, most highly skilled professionals no longer receive tuition subsidies for international schools from their employers after the Lehman Shock. Given high tuition fees (\$20,000 - \$32,000 per year), it is not easy for highly skilled migrants to send their children to international schools. Many of them thus send their children to local public schools, but are concerned that their children have a hard time adjusting to the school environment where multi-cultural awareness is lacking. Highly educated global professionals also want their children to develop multi-cultural understanding and acquire English language proficiency to become global professionals in the future. And yet, Japanese public schools fall short of meeting such expectations. Many highly skilled migrants thus decide to leave Japan to educate their children in a better environment.

Lastly, institutional barriers deter highly skilled migrants from settling down in Japan. Although social security contributions are mandatory and automatically deducted from every pay-check, migrants will not be able to benefit from the system unless they keep contributing to the social security system for 25 years.¹¹ While most industrialized countries have concluded over 100 social security agreements with other countries to make old-age pensions more portable and transferable, Japan has only concluded 14 agreements so far. Such a lack of institutional infrastructure triggers much anxiety among highly skilled migrants.

International students as prospective highly skilled workers

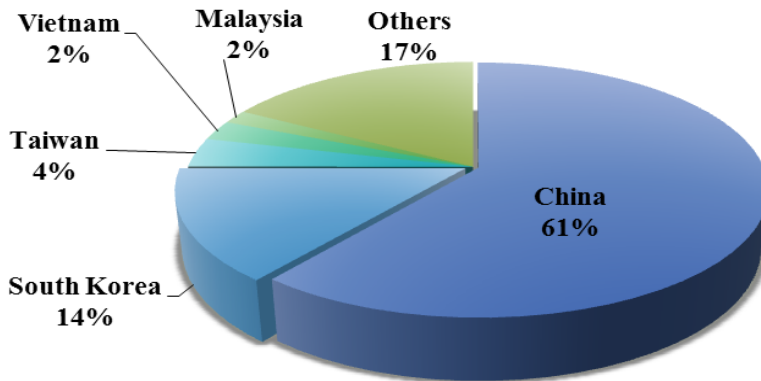
As in many other industrialized countries, Japanese policy makers and corporate leaders have perceived international students as prospective highly skilled workers and the key to future economic growth. The Japanese government has been promoting the migration of international students since 1983, aiming to accept 100,000 international students by the beginning of the 21st century. Since then, the number of international students has been rapidly increasing. The number of international students grew five-fold from 10,428 in 1983 to 52,405 within 10 years. In 2008, the Ministry of Education, Science and Technology (MEXT) announced the plan to increase the number of international students to 30,000 by 2020 (MEXT 2008) and started a program called "Global 30," which allocated resources for major universities willing to attract more international students by globalizing their curricula and programs.

In 2010, it reached 201,000, though this figure declined after the Great East Japan Earthquake in 2011 (MOJ 2012). Such trends also fill the needs of

¹¹ This will be reduced to 10 years in 2015.

many Japanese universities, which have been struggling with a rapid decline in the number of students due to low birth rates in Japan. As seen in Figure 2, over 60% of students come from China, followed by South Korea, Taiwan, Vietnam, and Malaysia.

Figure 2. International students by countries of origin



Source: Japan Student Services Organizations (2010)

However, according to the Japanese Business Federation (JBF), current student migration does not fully meet the Japanese labour market needs at present (JBF, 2009). According to the survey, while 54% of the recent labour demand was in science and engineering, only 20% of international students obtained degrees in such fields (MHLW 2008). In 2010, only 17% of international students were studying science and engineering (JASSO 2011). The JBF argued that the promotion of student migration in Japan would need to incorporate the demand-supply perspective and suggested setting the specific goal of increasing the number of international students in science and engineering from the current 21,000 to 70,000 (JBF 2009:17). However, university tuition for science programs are higher than those for the humanities and social sciences, which has been an obstacle for international students. The JBF argued that more government resources for scholarships need to be allocated to increase the number of international students in science majors.

Future challenges for migration in science and engineering in Japan

(1) The New Point System for Highly Skilled Professionals

The Great East Japan Earthquake and the following nuclear disaster in Fukushima in March 2011 had a tremendous impact on highly skilled migration in Japan. Between March 12 and April 18, 2011, the country saw the exodus of 531,370 migrants (MOJ 2011). Although most migrants eventually returned to the country, the overall number of migrants in Japan declined by 2.6% compared with those in 2010. The decline was particularly acute among

engineers (-8.5%) and international students (-6.4%) who are a critical workforce for the ICT industry in Japan (MOJ 2012).

The exodus of migrants accelerated the existing debate on attracting more highly skilled migration, and as a result, the Point System for the Highly Skilled (PSHS) was established in December 2011 and began to accept applications in May 2012. This system aimed to offer more incentives to qualified individuals to work and settle in Japan. The incentives include granting permanent residency in five years, a work permit for a spouse, a residency permit for parents and/or a domestic worker if the migrant has a small child. While the traditional definition of “highly skilled” refers to all migrants with work-specific visas, the newly established point system only targets those in engineering, academia, and finance who could obtain the minimum score of 70 points based on their qualifications such as education, work experience, annual income, language proficiency, and so on.¹² While this is definitely a new step forward to promoting highly skilled migration in Japan, scoring 70 points would be quite challenging for young engineers. As Table 4 shows, a bachelor’s degree only counts for 10 points, a master’s degree for 20 points, and a Ph.D. for 30 points.

The annual income criteria also pose challenges for young competent engineers. Migrant engineers can receive 40 points if they earn 10 million yen (\$107,000) a year or more (Table 5). However, the number of those who are qualified is small since the average annual income of a Japanese system engineer (age 36) is 5.6 million yen (MHLW 2012b). In fact, the existing data indicates that only 11% of foreign engineers earned 10 million yen a year or more (MOJ 2011). This is partly because almost 90% of migrant engineers are below the age of 40, and cannot earn such high salaries under the Japanese seniority-based pay scheme.

Table 4. The point system for engineers and other professionals¹³

Qualifications	Category	Points
Academic Qualifications	Ph.D.	30
	MSc.	20
	BSc.	10
Work Experiences	10+ years	20
	7-9 years	15
	5-6 years	10
	3-4 years	5
Age	29 years old or below	15
	30-34 years	10
	35-39 years	5

Source: Ministry of Justice (2011).

¹² Other grounds include a degree from a Japanese university, a certificate in his/her professional field, and an innovation-related grant from the Japanese government.

¹³ In addition to these criteria, there are various “bonus points” based on Japanese language proficiency, Japanese university degrees, publication/research records, and so on.

Table 5. The income points for engineers and other professionals

	<Age 29	Age 30-34	Age 35-39	Age 40+
10 million yen + (\$107,000+)	40	40	40	40
9 million yen (\$96,000)	35	35	35	35
8 million yen (\$86,000)	30	30	30	30
7 million yen (\$75,000)	25	25	25	25
6 million yen (\$64,000)	20	20	20	-
5 million yen (\$54,000)	15	15	-	-
4 million yen (\$43,000)	10	-	-	-

Source: Ministry of Justice (2011)

Given the current age/income distribution of migrant engineers, the vast majority of them will not be qualified as “highly skilled” to benefit from the new scheme. Many migrants whom I interviewed replied that this system would not entice them since the incentives were too small and not too appealing. Policy makers acknowledge its limited impact, but believe that the new point system would at least change the image of Japan as a closed country, and project a message to the world that Japan would welcome highly skilled migrants. The government is also considering revising the criteria in the near future and has already solicited some feedback from business organisations.

(2) *Local Initiatives for Promoting Highly Skilled Migration*

It is noteworthy that local initiatives have been emerging to promote more highly skilled migration. The Tokyo Metropolitan Government (TMG), for instance, has established the “Special Zone for Asian Headquarters” in January 2012, aiming to “have Tokyo become the site for the Asian headquarters of global business, and consequently, the business hub of Asia” (TMG 2012). This initiative came into existence partly as a response to the gradual relocation of Asian headquarters of multinational corporations to Hong Kong, Singapore, and China in recent years. It aims to bring in more foreign direct investment and highly skilled migrants to Tokyo.¹⁴ Osaka city also established a

¹⁴ As part of the incentives, the TMG ensured offering concierge services in English to assist multinational corporations, and also vowed to increase the number of foreign lawyers and medical doctors. These measures, which required the deregulation of immigration restrictions, were

plan to become a “Growth Strategy Hub” in 2011 to attract more foreign direct investment and highly skilled migrants. The actual incentive package for highly skilled migrants and the extent of their impact on ICT and other sectors are not yet clear at this point. However, these newly emerging initiatives could certainly be an important step in increasing the number of migrant engineers along with other highly skilled migrants in Japan.

The long-term sustainability of highly skilled migration in Japan

As discussed earlier, Japan has been depending overwhelmingly on China and Korea as sources of migrant engineers and other highly skilled migrants. Nevertheless, the sustainability of such dependence is not secure. Growing political tensions and nationalism have already been affecting the inflow. The number of highly skilled migrants from China and Korea dropped by 51% and 34% respectively between January and November 2012 (MOJ 2012). Furthermore, population aging in these countries is another concern. Korea now has a lower birth rate than that in Japan, and China is also experiencing rapid population aging. The ratio of the working population to the total population will rapidly decline in China, though not as seriously as Japan. Given such a demographic transition, Noguchi (2011) doubts the sustainability of Japan’s dependence on China for highly skilled migrants in the near future. My research also reveals that the majority of Chinese international students, who belong to the “only-child” generation, are inclined to return to China after several years to live close to their parents. Very few of them are planning to stay overseas for their whole life..

Another important point for consideration is that both China and Korea have also been emerging as major “brain magnets.” They have been trying to retain their own highly skilled citizens and also to attract global talent from other countries. In 2008, the Korean government established the World Class University Initiative, which was to invite the world’s top-class researchers to Korea. The Korean government has also been allocating 5.2 trillion won (\$4.8 billion) to establish the International Science and Business Belt by 2017 (METI 2011a). Its multiple visa schemes facilitate the migration of highly skilled professionals in basic research in science (Science Card), IT (IT Card), and business (Gold Card). These qualified migrants are conferred a permanent residency status (Hugo 2009:80), which could serve as a significant incentive for global professionals to work in Korea.

The Chinese government has also been developing various strategies to attract highly skilled professionals. Its “111 Plan” in 2006 set the goal of establishing 100 joint research teams between Chinese researchers and foreign researchers by inviting over 1,000 researchers from the world’s top 100 universities and research institutes. To meet this goal, the government allocated 1.8 million Yuan (\$286,000) for each participating university. In 2009, the gov-

successfully approved by the national government. This plan also included the establishment of English medium schools for children of highly skilled migrants.

ernment inaugurated the “1,000 Plan” which was to invite 1,000 top researchers from around the world to participate in the State-funded research projects by offering a lump sum grant of one million Yuan (\$160,000) for each researcher (METI 2011b). Other Asian economies have also been actively promoting highly skilled migration through various policy initiatives.

Concluding remarks

Given the accelerating population aging as well as the growing global competition for talent, many Japanese policy makers and corporate leaders now believe that highly skilled migration will be one of the keys to the country’s socio-economic sustainability and innovation-driven growth in the knowledge economy. Nevertheless, Japan has still not been able to attract enough highly skilled migrants, particularly those in science and engineering, despite the fact that the government has been adopting lenient immigration policies. As I argued above and elsewhere (Oishi 2012), immigration policies could set up an overall framework but have limits in bringing highly skilled individuals who mostly make their decisions based on the information of actual job offers as well as other social factors (e.g. international education for children and job opportunities for spouses) that could affect them. The newly introduced point system is certainly an important first step forward in promoting highly skilled migration. However, it definitely needs further revisions to enhance attractiveness to global professionals.

Overall the current working environment that surrounds migrant engineers in Japan is not necessarily a favourable one compared with that in other Asian countries, let alone other industrialized countries. More emphasis on meritocracy, performance-based pay schemes and diversity management is needed in the workplace. Japanese corporations need major reforms to enhance their attractiveness by further globalizing their operations and adjusting their human resource practices to global standards in terms of recruitment, remuneration, and promotion.

Lastly, improving the quality of tertiary education would be crucial for Japan’s future competitiveness in science and technology. Japanese universities – an incubator of cutting-edge knowledge and technology as well as an institution to train the prospective highly skilled workforce – need to become more globalized to attract more international students. Furthermore, more resources need to be allocated for research and teaching at Japanese universities to release high performing scholars from heavy teaching and administrative loads and to let them focus more on research. Improving research output would help improve the international standing of Japanese universities and will help attract more international students of high calibre. The quality of Japanese students will improve as well. Research and education must be the double wheels of higher education in Japan.

As many scholars have argued, human capital has been and will continue to remain a major component of national competitiveness. In this regard, the

government should adopt more comprehensive human capital development strategies, which will integrate tertiary education policies and immigration policies on international students as well as highly skilled migrants.

References

- Business Software Alliance (BSA). 2011. *Investment for the Future: Benchmarking IT Industry Competitiveness 2011*. Economic Intelligence Unit.
- Cabinet Office. 2003. *E-Japan Strategy II* (in Japanese). July 2. http://www.kantei.go.jp/foreign/policy/it/0702senryaku_e.pdf Accessed on December 5, 2011.
- Cabinet Office. 2010. *New Growth Strategy* (in Japanese). June 18. <http://www.kantei.go.jp/jp/sinseichousenryaku/sinseichou01.pdf>. Accessed on February 15, 2013.
- Cabinet Office. 2012. *Rebirth of Japan: A Comprehensive Strategy* (in Japanese). July 31. http://npu.go.jp/policy/pdf/20120821/20120821_en.pdf Accessed on August 20, 2012.
- CESifo Group. 2009. "International Mobility of the Highly Skilled." CESifo DICE Report. Pp.51-54. <http://www.cesifo-group.de> Accessed on March 10, 2012.
- Council on Fiscal and Economic Policy (CFEP). 2007. *Grobaru Senryaku (Global Strategies)*. Cabinet Office, Tokyo.
- Douglass, John Aubrey and Richard Edelman. 2009. *The Global Competition for Talent: The Rapidly Changing Market for International Students and the Need for a Strategic Approach in the US*. Research and Occasional Paper Series. CSHE.8.09. Center for Studies in Higher Education. University of California, Berkeley.
- HITO Research Institute (HRI). 2011. Gaikokujin no Shinsotsusaiyo ni Kansuru Kigyo Ishikichosa (Survey on Corporations' Recruitment of Newly Graduates). HITO Research News: Tokyo.
- Hugo, Graeme. 2009. *Labour Mobility in the Asia-Pacific Region: Dynamics, Issues and a New APEC Agenda*. Institute of Southeast Asian Studies. Singapore.
- Information-technology Promotion Agency. (IPA). 2012. *IT Jinzai Hakusho (IT Human Resources White Paper)*. Tokyo.
- Institution of Professional Engineers, Japan (IPEJ). 2011. "APEC Engineers" (in Japanese). <http://www.engineer.or.jp/sub06/> Accessed in February 10, 2012.
- International Institute for Management Development (IMD). 2012. *World Competitiveness Yearbook*. IMD: Lausanne.
- Japan Business Federation (JBF). 2009. *Kyousouryoku Jinzaino Ikuseito Kakuboni Mukete (Toward Training and Securing Competitive Labor Force)*. April 14.
- Japan Information Technology Service Industry Association (JISA). 2011. *IT Sangyou no Doukou (Trends in IT Industry)*.
- Japan Institute for Labor Policy and Training (JILPT). 2009. *Nibonkigyoniokeru Ryugakuseino Shuroni Kansuru Chousa (Survey on the Employment of Former International Students in Japanese Corporations)*. JILPT: Tokyo. June.
- Japan Student Services Organization (JASSO). (2011). *Gaikokujin Ryugakusei Shin-rojoukyou Gakuijuyoukyou Chosakekka in AY2009 (A Survey on the Postgraduate Situation of International Students)*. Retrieved from
- Kuetsch, Christiane and Eng Fong Pang. 2006. *Competing for Global Talent*. International Labour Office. Geneva.
- Ministry of Economy, Trade, and Industry (METI). 2010. *Trade White Paper* (in Japanese). Tokyo.

- Ministry of Economy, Trade, and Industry (METI). 2011a. *Gyoshibetsu Toukeihyou: Jouboushori Teikyou Sabisugyou (Sector Specific Statistics: Information Services Sector)*. Tokyo.
- Ministry of Economy, Trade, and Industry (METI). 2011b. *Kenkyukaihtsuno Koku-saikansuite (Internationalization of Research and Development)*. Kenkyukaihatu Shouinukai Shiryou 5. Tokyo.
- Ministry of Education, Science, Technology, and Sports (MEXT). 2008. *Ryugakusei 30mannin Keikaku Kosshi (The International Students 300,000 Plan - The Outline)*. July 29. http://www.mext.go.jp/b_menu/houdou/20/07/08080109.htm. Accessed on February 15, 2013.
- Ministry of Education, Science, Technology, and Sports (MEXT). 2012. *Grobarujinzai Ikuseisenryaku (Strategy for Developing Global Human Resources)*. Tokyo.
- Ministry of Internal Affairs and Communications (MIC). 2012a. *Joubou Tsushingyou Kibonchousa Houkokusho (Basic Survey Report on ICT Industries)*. <http://www.soumu.go.jp/johotsusintokei/statistics/data/jouhoutsuusin120323b.pdf>. Accessed on February 15, 2013.
- Ministry of Internal Affairs and Communications (MIC). 2012b. *Roudouryoku Chousa (Labor Force Survey)*. <http://www.stat.go.jp/data/roudou/index.htm>. Accessed on February 15, 2013.
- Ministry of Health, Labor and Welfare (MHLW). 2008. *Ichibujokigyo honshaniokeru gaikokujinshainno katsuyojittaini kansuru anketochosa [A survey on human resources management on foreign employees in large public companies]*. Tokyo, Japan: Author. Retrieved from <http://www.mhlw.go.jp/houdou/2008/12/h1208-1.html>. Accessed on February 17, 2013.
- Ministry of Health, Labor and Welfare (MHLW). 2012a. *Gaikokujinkoyoujoukyou no Todokede Joukyou (The Situation of Foreign Workers Employment)*. <http://www.mhlw.go.jp/stf/houdou/2r985200000117eu.html>. Accessed on February 17, 2013.
- Ministry of Health, Labor and Welfare (MHLW). 2012b. *Chingin Kouzou Kibon Tonkei (Wage Structure Basic Statistics)*. <http://www.e-stat.go.jp/SG1/estat/NewList.do?tid=000001011429----->. Accessed on February 15, 2013.
- Ministry of Justice (MOJ). Various Years. *Immigration Statistics*.
- Ministry of Justice (MOJ). 2008. *Gijutsu Oyobi Jinbunchishiki Koku-saigyomuni no Zairyushikakuno Meikakukatouni Tsuite (The Clarifications of Visa Status of "Engineer" and "Humanity and International Affairs")*. March.
- Ministry of Justice (MOJ). 2011. *The Draft Plan for the Point System*. Unpublished document.
- Ministry of Justice (MOJ). 2012a. *Touroku Gaikokujin Toukei Toukeihyou (Statistical Table of Registered Foreigners)*. http://www.moj.go.jp/housei_toukei/toukei_ichiran_touroku.html. Accessed on February 16, 2013.
- Ministry of Justice (MOJ). 2012b. *Heisei23nenniokeru Nibonkigyoutoubeno Shusbokawo Mokutekitoshita Gijutsu Matava Jinbunchishiki Koku-saigyomuni Kakawaru Zairyushikakuninteisboumeisho Koufujoukyounitsuite (The Situation of Visa Issuance for Engineers and Specialists in Humanities and International Services to Work for Japanese Corporations in 2014)*. <http://www.moj.go.jp/content/000100381.pdf>. Accessed on February 16, 2013.
- National Institute for Population and Social Security Research (NIPSSR). 2012. *Nihonno Sborai Suikei Jinko (Population Estimate for Japan)*. <http://www.ipss.go.jp/syoushika/tohkei/newest04/sh2401top.html>. Accessed on February 3, 2013.

- Nikkei Computer*. 2006. "Nihonjin Gijutsusba to Kigyowa 3nen Sonshiteiru." January 9.
- Nikkei Shimbun* (Newspaper). 2011. "Tenkimukaeta Shukatsu, Raibaruwa Sekaijuni." April 20.
- Nikkei Shimbun* (Newspaper). 2012. "Ajiano Kagaku Gijutsu Kyousou (The Competition in Science and Technology in Asia)." January 24.
- Noguchi, Yukio. 2011. "Shouraiwa Muzukashikunaru Chishiki Roudousha no Ukeire." *Shukan Tonyou Keizai*. March 5.
- Oishi, Nana. 2012. "The Limits of Immigration Policies: Highly-Skilled Migration in Japan." *American Behavioral Scientist*. Volume 56, pp.1080-1100. August.
- Organization for Economic Cooperation and Development (OECD). 2008. *The Global Competition for Talent: Mobility of the Highly Skilled*. OECD:Paris.
- OECD. 2012. *Better Life Index*. <http://www.oecdbetterlifeindex.org/countries/japan/> Accessed on February 3, 2013.
- Shachar, Ayelet. 2006. "The Race for Talent: Highly Skilled Migrants and Competitive Immigration Regimes." *New York University Law Review*, Vol. 81, April. Pp.148-206.
- United States Department of Labor (USDOL). (2011). *Occupational Outlook Handbook*. <http://www.bls.gov/oco/ocos027.htm#earnings>. Accessed on December 10, 2011.