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Analysis of Cross-Border Higher Education for Regional Integration and Labor Market in East Asia

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Cross-Border Higher Education for Labor Market Needs:

Mobility of Public-Funded Malaysian Students to Japan over Years

Yoshiko Koda[*], Takako Yuki[**], and Yeeyoung Hong[***]

Abstract

As globalization and the knowledge economy spreads, the demand for highly skilled workers has increased and developing countries are engaged in cross-border higher education to develop high level human resources for their nations. Using data on a cross-border higher education program between Malaysia and Japan, namely the Higher Education Loan Project (HELP1 and HELP2), this paper explores whether publicly funded cross-border higher education programs have yielded their expected outcomes (i.e., employment immediately after graduation) over the last ten years in the context of the rapidly changing Malaysian economic and higher education landscape. Our findings indicate that the program has met its intended outcomes, that is, the graduates have been absorbed in the industries they intended to work in or have continued with further studies, which are both conducive to Malaysian national development. However, our findings on the rates of graduates staying after completing their degrees imply that factors such as the host country's immigration policies may influence the decision by graduates on where to work.

Keywords: Cross-border higher education, Engineering education, Study abroad, Twinning, Malaysia

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1. Introduction

As globalization and the regional integration of economies deepens and the knowledge economy spreads wider, internationally well-educated workers with a high level of knowledge become important assets for national and economic development both for developing and the OECD countries. As a means of responding to this rapid increase in demand for high level human resources, various kinds of cross-border higher education, ranging from traditional study abroad to the establishment of branch campuses of foreign higher education institutions has become a growing trend around the world (OECD 2009).

Cross-border higher education in Asia is also an area where the Japanese government has been providing support through its official development assistance (ODA) over the years in the form of both grants and concessional loans. In fact, as Yoshida (2009) illustrates, higher education accounts for the largest share of the Japanese ODA in the field of education. This concentration of Japanese ODA in Asia has been a long-standing ODA policy of Japan. More recently, the Japanese government has reiterated its determination to advance regional collaboration in higher education as a means for the formation of an "East Asian Community" (Kuroda, Yuki, and Kang 2010). Many Japanese ODA-funded higher education projects and programs not only support the cross-border mobility of students and scholars from Asian countries to enable them to come to Japan, but also provide opportunities for Japanese scholars and Japanese participation in educational programs in Asian countries for the purpose of developing the capacity of higher education institutions in these countries.

Human resources development has been one of the core policies of Malaysia's national development plans (EPU 2006; FASID 2007). As a means of human resources development, Malaysia has been actively engaged in cross-border higher education both as a sending and host country. The Japanese government has been assisting the Malaysian government in its efforts to build human resources, especially after 1981 when the then-Prime Minister Mahathir Mohamad announced his Look East Policy. The policy aimed to emulate the Japanese and

Korean work ethic, management styles, and successful development experience (FASID 2007).

Japanese ODA has been supporting cross-border higher education activities in engineering fields since 1993 to meet the needs of the Malaysian manufacturing sector in which Japanese firms have a substantial presence (OECF 1991; 1992; 1999a; and 1999b). This includes the Higher Education Loan Projects (HELP), which consist of three phases (HELP1, HELP2, and HELP3) and reflect the changing needs of the Malaysian economy and higher education landscape. HELP1 (1995- 2003) was a conventional "study abroad" program with 2 years of pre-university education (1993-1997) in Malaysia and four-year undergraduate education at a Japanese higher education institution. HELP2 (2001-2008) was a twinning arrangement with 1 year of pre-university education, 1 year undergraduate engineering education in Malaysia, and 3 years in Japan. HELP3 (2005-2015) is an on-going project with 1 year preparation, 2 years undergraduate engineering education in Malaysia, and 2 years in Japan. Furthermore, to accommodate the needs of Malaysia, scholarships for masters degree programs were added in HELP2 and PhD programs in HELP3. Since HELP3 is still an on-going project and did not have any graduates at the inception of this research, this paper only focuses on HELP1 and HELP2.

How and to what extent have these cross-border higher education programs actually met the needs of the Malaysian manufacturing sector under changing economic and educational contexts over time? Building on the previous studies and the data prepared for the assessment and monitoring of the HELP1 and 2 projects, this paper aims to examine the labor market outcomes for the Malaysian youth who participated in these two publicly funded cross-border higher education programs between Malaysia and Japan from the early 1990s to the late 2000s.

Section 2 of this paper provides a brief literature review on cross-border higher education and labor market outcomes and describes research questions and data sources. In Section 3, after a brief review of the changing Malaysian economy at the macro level, the

paper tries to capture the changing capacity of the Malaysian domestic higher education system, mainly focusing on undergraduate levels, to respond to the national development strategies and the expanding economic needs. Then, using data at the company level, it explores the needs of the manufacturing sector for engineers and university graduates. Section 4 examines the labor market outcomes of the HELP1 and 2 programs, focusing on the activities of the grantees just after their graduation. Finally, Section 5 concludes this paper.

2. Research framework

As student mobility across borders increases, newer modes of cross-border higher education have been mushrooming. According to Knight (2008), the concepts that describe the international activities of higher education have proliferated to the extent that the relationships and nuances of meaning among "cross-border," "transnational," "borderless," and "international" modes of education are causing confusion (Knight 2008, 2). Furthermore, Knight claims that the concept of the international aspects of higher education have shifted from "activities" (e.g., international cooperation, study abroad, and international agreements) in the 1980s to "mobility" (e.g., the mobility of the students, programs, providers, curriculums) in the mid-1990s. (also OECD and World Bank 2007). This paper treats cross-border higher education as a single overarching concept of mobility that involves both students and programs. More specifically, the paper examines two types of cross-border higher education programs—one is the conventional "study abroad" and the other is twinning arrangements—but treats them as one cross-border higher education scheme.

What benefits and risks should developing countries anticipate by incorporating cross-border higher education as an instrument for their human resources development? Lancrin (2007) points out that there are three main reasons for developing countries to become engaged in cross-border higher education: (i) expanding access to higher education, (ii) the provision of a wider selection of learning opportunities that are not available domestically, and (iii) the improvement of domestic higher education institutions through the mobility of programs and providers (OECD-World Bank 2007).

However, engaging in cross-border higher education also involves potential risks, including inequality in the access to higher education, low quality education, the brain drain, and the instability of commercial-based educational provision (Altbach and others 2009; Altbach and Knight 2006; Bashir 2007). Furthermore, there are emerging concerns about the quality and relevance of tertiary education. This is partially due to the rapidly expanding

provision of higher education around the world, whose quality and relevance is difficult to assess (OECD-World Bank 2007). This rapid expansion of cross-border tertiary education also raises concerns about the level of the skills that the graduates acquire and about the oversupply of higher education graduates (Machin and McNally 2007; Santiago and others 2008).

As for the potential brain drain through higher education, the emigration rate of skilled workers has been accelerating as the competition for the highly skilled talent intensifies around the world. Although the data on international migration is scarce, Docquier and Marfouk (2006) estimates that between 1990 and 2000 the stock of tertiary educated migrants increased by about 800,000 a year, while the total stock of migrants increased by about 1.7 million a year. Many OECD countries have been actively seeking ways to attract highly skilled migrants in recent years and the loss of this talent is often considered a serious problem for developing countries.

With regards to the question of whether cross-border higher education induces a brain drain, OECD and the World Bank (2007, 12) point out that "student mobility and the acquisition of foreign qualifications could lead to a brain drain rather than an increase in the stock of qualified human capital available in the country. " In such cases, the investment in education in developing countries is wasted, especially when education is publicly funded[1]. However, recent literature indicates that skilled migration could benefit the sending countries. For instance, Beine et al. (2001) argues that the possibility of migration actually provides incentives to accumulate skills among people in the sending countries, thus generally improving human capital in these countries. Due to the limited nature of the data usable for this paper, the objective of this paper is a modest one. Rather than exploring the issue of a brain drain or brain gain, the paper simply tries to capture the post–graduation activities (i.e., the first

[1] For instance, 41% of the 1987/88 foreign graduates with doctoral degrees in science and engineering from US universities were still in the US in 1992 whereas 56% of the 1996 graduates were in the US in 2001, which seems to indicate that the trend for graduates to stay on after graduation increased between these years. In terms of disciplines, computer and EE (electrical and electronics) engineering graduates tended to have the highest rate of staying on. Among the 1996 graduates with computer and EE engineering degrees, 73% were still in the US in 1997 and 70% were still in the US in 2001 (Finn 2003).

activities after graduation) of the graduates of cross-border higher education programs. Since much of the literature on the brain drain is theoretical and little empirical research exists, it is our hope to add modest evidence of the post-graduation activities of those involved in cross-border higher education programs as a precursor to the issue of whether there is a brain drain or brain gain over the longer term.

2.1 Research questions

This paper aims to analyze the labor market outcomes of Malaysian youth who participated in public-funded cross-border programs between Malaysia and Japan, with a focus on HELP1 and HELP2 mentioned above. First, the paper clarifies the contexts in which HELP1 and 2 operated by exploring the following questions: in the face of the changing needs for highly skilled human resources in the Malaysian manufacturing sector over the past two decades, how the capacity of Malaysian higher education has changed to meet labor market demand through domestic higher education institution development as well as cross-border higher education activities, and what were the overall characteristics of Malaysian students in Japan. Then, the paper asks the key question of whether and how the labor market outcomes of HELP1 and 2 have met the demand from the manufacturing sector over the years, both quantitatively and qualitatively. More specifically, the paper analyzes the impact of these two programs on the labor market as measured by the post-graduation status of students immediately after their graduation between 1999 and 2008 with regard to employment (or graduate school enrolment), skills relevance, and rate of staying on after graduation.

2.2 Data

This paper uses the project management and monitoring data of Yayasan Pelajaran MARA (YPM), the executing agency of HELP1 and HELP2 in Malaysia. Two data sets are

used for this paper: one comprises academic information on all students who entered the program in Japan and the other was collected from all the graduates around the time of program completion (i.e., usually within a few weeks before or after graduation). Although the collected information varies from year to year, the former includes the name of their university, department, and faculty and the latter includes information on post-graduation activities, the employer, and university/faculty. In total, the data for 548 graduates from undergraduate studies (between 1999 and 2008) was found to be valid as a dataset.

For contextual analyses, this study also uses published and unpublished data and statistics from the Malaysian and Japanese governments, courtesy of the data holding organizations, as well as international organizations. Those include the 2007 dataset of the Productivity and Investment Climate Survey (PICS) 2 by the Economic Planning Unit (EPU) of Malaysia and the World Bank. This is a survey of companies and includes data such as that on the existing and new employees with a higher education degree and where the degree was obtained.[2] The paper also uses statistics on Malaysia's domestic graduate tracer studies (2007-2009) by the Ministry of Higher Education, which includes, inter alia, information such as the post-graduation activities of domestic public higher education graduates by field, type of employer, and type of higher education institution.[3] With regard to foreign students in Japan, the paper uses the 2005-2009 data obtained from the Japan Student Services Organization (JASSO), which includes the number of foreign students and Malaysian students in tertiary education institutions in Japan by funding type.

[2] PICS2 data is downloaded from www.enterprisesurveys.org.
[3] Statistics received from the graduate tracer study team of the Ministry of Higher Education in 2009 and 2010.

3. Changing contexts

As a part of its national development policy, Malaysia has been making continuous efforts to improve its human resources over decades. Nevertheless, a shortage of high level human resources has been one of the main concerns of Malaysia in moving up the value chain in the global economy. This section briefly examines the overall economic growth of Malaysia and the changing supply and demand for highly skilled human resources, especially engineers, in the manufacturing sector.

3.1 The changing Malaysian economy, manufacturing sector, and relations with Japan

Malaysia, as an upper middle income country with an estimated population of 28.1 million people in 2009, is a forerunner of economic development in the Southeast Asian region after Singapore. As reported by the World Bank (2009a), together with the service sector, the manufacturing sector has been the main driver of rapid GDP growth over the past few decades.[4] Within the manufacturing sector, the Electrical and Electronics (E&E) industry is the dominant industry. Between 1999 and 2005, over a quarter of the total value-added manufacturing products and over a half of exports came from the E&E industry (World Bank 2009b).

Malaysia has also been one of the preferred locations for foreign direct investment (FDI) over the years. Again the E&E industry is the one that has been attracting a large share of foreign investment over several decades. Japan has often been among the top three foreign investors. The 5-year averages for Japanese FDI in various industries between 1990 and 2004 indicate the concentration of FDI on the E&E industries. During this period, 30 to 40% of Japanese FDI in the Malaysian manufacturing sector went to the E&E industries. In recent years this trend has become more prominent. Between 2005 and 2009 the share represented by

[4] The Manufacturing sector's production accounted for 17% of the GDP in 1980 and the share increased to 32.1% in 2008. As for the service sector, it was 43% in 1980 and increased to 59% in 2008. As for agriculture, it was 21% in 1980 but declined to 8% in 2007 (EPU 2009).

the E&E industry of Japanese FDI (on an asset basis) in the Malaysian manufacturing sector was 46%.[5]

While Malaysia's economic growth in the past few decades is impressive, in the rapidly changing global and regional landscape of competition, the country faces the risk of falling into a middle income trap. Having achieved rapid economic development, Malaysia has been losing its comparative advantage as a low cost mass production site and faces challenges to transforming itself into a knowledge-based economy (World Bank 2009a).

3.2 Malaysian government's human resources policy and the changing capacity of higher education

3.2.1 Domestic higher education institutions in Malaysia

The Government of Malaysia has played an active role in creating an enabling environment to meet Malaysia's human capital development targets through the formulation of a regulatory framework for higher education. This emphasis on human capital development is stipulated in its consecutive five-year plans and more recently in a higher education sector strategy (Ministry of Higher Education 2007a; Sirat 2006; Moris 2007; OECF 1991, 1992). However, since 1996 the overall context of Malaysian higher education changed dramatically. Aiming to enhance access to higher education within Malaysia, the Government enacted in 1996 a series of laws to improve access to and the quality of higher education institutions, which include the Private Higher Education Institutions Act (Act 555). According to Sirat (2006), prior to this Act, private higher education institutions could not offer first degrees (at the bachelor level). They had to form partnerships with domestic public universities or foreign universities to offer them.

From 2000 to 2007, the number of universities and colleges that can award degrees

[5] Our calculation using Tainai oyobi Tainai Chokusetsu Toshi Jokyo (Ministry of Finance of Japan) and International Current Account Statistics (Kokusai Shushi Tokei) of the Bank of Japan (downloaded from www.boj.or.jp/theme/research/stat/bop/index.htm#dip). Caution is needed since the methods used for Japanese FDI data collection changed after 2005.

greatly increased. As Figure 1 indicates, prior to 1996 there were 9 public higher education institutions. By 2007 the number of public higher education institutions reached 20 while 37 private higher education institutions were established. Consequently, the gross enrollment rate for tertiary education increased from 8.1% in 1991 to 25.9 % in 2000, and to 29.7 % in 2006.[6] The Government of Malaysia reports that the higher education participation rate for the 17 to 23 year age group increased from 27% in 2005 to 31.4% in 2009 (EPU 2010).

In terms of engineering students at the undergraduate level, the number of students enrolled almost doubled from 38,649 in 2002 to 75,170 in 2009. During the same period, the number of undergraduate students enrolled in all fields also increased from 251,000 in 2002 to 471,000 in 2009. The proportion of undergraduate students in engineering fields did not change between 2002 and 2009 (Figure 2). In post-graduate schools, the number of students enrolled in technology-related fields, including engineering, increased more than twofold (from 3,638 in 2002 to 8,817 in 2009) at the master's level and almost eightfold (from 440 in 2002 to 3,171 in 2009) at the Ph.D. level. The 9th Malaysian Plan aims to increase the proportion of post-graduate enrolment to 25% of the total number of undergraduates. This still means there is a long way to go since the proportion of post-graduates is 14% of the total number of students enrolled in undergraduate programs in 2009. It was 12% in technology fields in 2009.[7]

As Figure 3 shows, reflecting the increasing student enrollment at the undergraduate level, the number of the graduates increased by 51% from 2002 to 2008 (57,057 in 2002 to 86,434 in 2008). In terms of technical degrees (including engineering), a similar trend is observed. While the number of graduates at the diploma level contracted during this period, especially after 2005, the number of graduates increased by 143% at the undergraduate level in technical fields, by 73% in masters degrees and by 13% in Ph.D.s between 2002 and 2008.

[6] Data downloaded from the World Databank (http://databank.worldbank.org/ddp/home.do)
[7] Calculated based on the Perangkaan Pengajian Tinggi Malaysia Tahun 2009 (MOHE). Downloaded from www.mohe.gov.my/web_statistik/#data_macro on 7/9/10

3.2.2 Cross-border higher education activities of Malaysia

In the face of the growing need for highly skilled human resources, how has Malaysia used cross-border higher education for its human resources development and higher education development? Long before the current surge of student mobility around the world and when the capacity of Malaysian higher education institutions was much more limited, Malaysia was sending its students to overseas higher education institutions as a part of human resources development for the nation. The Mid-term Review of the Third Malaysia Plan 1976-1980 indicates that 36,000 students studied at secondary, pre-university, diploma and degree levels abroad in 1978 (Cited in Moris 2007, 30).

More recently, Malaysia remains among the top 10 countries of origin for internationally mobile students. It is difficult to get an accurate picture of student mobility but a combination of different sources indicates that Japan is one of the preferred destinations of Malaysian students. Based on the Global Education Digest of UNESCO (2009), Table 2 depicts the number of Malaysian students for the top five destinations: while Australia and UK alone receive more than a half of Malaysian students studying abroad, Japan is the fourth destination after Australia, the UK and the US and annually received over 2,000 Malaysian students between 2006 and 2008. Another source from the Malaysian Ministry of Higher Education indicates that Japan was in tenth place as a destination for Malaysian students in 2008 and ninth in 2009, with 1,182 and 1,584 students, respectively.[8] However, in terms of government-sponsored students, Japan was the sixth most favored destination in both years, superseded only by Egypt, Indonesia, the UK, Australia, and New Zealand in 2008 and by Australia, Egypt, the UK, Indonesia, and the US in 2009. Japan received 1,092 Malaysian students out of the 21,517 publicly funded students in 2008 and 1,494 out of the 38,593 in 2009. As discussed later, government-sponsored students are the core group of Malaysian

[8] Based on Statistical information on MOHE web site (www.mohe.gov.my/web_statistik/index.htm)

students in Japan.

This flow of Malaysian students to Japan reflects the Look East Policy that started in 1982 under the then-Prime Minister Mahathir's leadership to increase productivity by incorporating the Japanese and Korean work ethic in public offices as well as in government-related companies (Sugimura 2006). The Public Service Department (JPA), which is one of the government agencies in charge of scholarships for studying abroad, sent in total 12,593 new students to Japanese tertiary education institutions at all levels between 1982 and 2010 under the Look East Policy. Of these students, 3,226 were in first degree programs.

3.3 Manufacturing sector's changing need for and views on human resources development

So far, this study has reviewed the Malaysian government's policy in response to the increasing need for high level human resources as its economy grew. However, has the increased capacity in higher education actually met the needs of the changing economy? Mainly based on a survey of companies called the Productivity and Investment Climate Survey (PICS), this section analyzes the labor market situation in Malaysia, focusing on university degree holders in manufacturing firms. In so doing, the paper looks at two issues that the Malaysian manufacturing sector faces today: the shortage of highly skilled workers and the quality and relevance of their skills.

In the early 2000s, the relatively small pool of highly skilled workers was cited as one of the barriers to Malaysian national development since it prevented the country from becoming a preferred location for higher value-added industries (World Bank 2005; Okamoto 2002). Based on the 2007 survey of companies in Malaysia, the World Bank (2009a) reported some improvement in the availability of professionals, including engineers, but this was not enough to respond to the labor market demand. The same report indicates that the percentage of employees with university degrees increased from 10% in 2002 to 15 % in 2007. Table 3

shows the shares of three types of newly recruited university degree holders at the firms that employed engineers.[9] While those with local university degrees were the predominant group of newly recruited employees with university degrees (85% of 4,358 new recruits with university degrees) for all manufacturing industries in 2006, these firms also hired a not-negligible proportion of new recruits who had been educated overseas (11% of the 4,358). In some industries, such as the electronics industry, 19% of the 2006 new recruits with university degrees were educated overseas.

The second human resources issue is the quality and relevance of the knowledge and skills of the university degree holders. While the Malaysian government's efforts to increase the number of higher education graduates have certainly yielded fruit, the PICS 2007 report points out that these "workers lack the basic and technical skills appropriate for their jobs. This is the main reason why there is such a high vacancy rate for professionals and skilled production workers, according to company managers in Malaysia" (World Bank 2009a, 120). In both the manufacturing and the business support service sectors, the lack of basic and technical skills is among the most serious constraints. In contrast, the problem of "universities not producing a sufficient number of graduates" is considered less of a problem in terms of filling vacancies, especially in the manufacturing sector.

Since HELP1 and 2 were designed to promote education in engineering, it would be useful to examine whether the quality and relevance of the knowledge and skills of engineers are among the main factors that limit the ability of companies to fill the vacancies. Unfortunately, the survey does not include data on the vacancies for engineering positions. Instead it has data on vacancies for professional positions in general, which include engineering. Among the firms that employ engineers and have vacancies for professionals, only 4% consider that "universities are not producing a sufficient number of graduates" is the

[9] Our calculation of the PICS1 data for manufacturing firms shows that, in 2007, 32% of the 1,115 sample firms employed engineers while the share is much higher within the E&E industry (i.e., 74% of firms in the E&E industry have engineers).

most important constraint on filling vacancies, while 21% and 17% of firms consider the lack of basic and technical skills, respectively, are the most important constraints.[10] This may indicate that the quality rather than the quantity of professionals that universities produce is a serious problem for these firms.

In PICS 2007 the firms were also asked to evaluate the performance of three types of professionals with different educational backgrounds (i.e., locally educated Malaysians, foreign trained Malaysians, and foreign professionals). Figure 4 shows the evaluation by companies of professionals with different backgrounds: (1) overseas educated Malaysian professionals compared with locally educated Malaysian professionals and (2) overseas educated Malaysian professionals compared with foreign professionals.[11] In the first comparison, 36 percent of the firms perceived that the performance of overseas educated professionals was higher than that of locally educated professionals, while 16 percent regard it as being lower. In the second comparison, 26 percent of the firms perceived that the performance of overseas educated Malaysian professionals was higher than that of foreign professionals while 11 percent thought that it was lower. This could be an indication that the performance of foreign trained Malaysian professionals is perceived to be a better fit for certain industries in the manufacturing sector.

[10] Calculation by the authors.

[11] PICS2 asked firms to rate the performance of three categories of professionals for comparison. The original codes for "locally educated Malaysian professionals vs. overseas education Malaysian professionals" were reversed to "overseas educated Malaysian professionals vs. locally educated Malaysian professionals" since our primary subjects are the former.

4. Labor market outcomes of cross-border (between Malaysia and Japan) higher education

The previous section indicates that the Malaysian government policy regarding human resources development has resulted in a rapid increase in the number of undergraduate degree holders over the past two decades through the development of the domestic higher education system and the utilization of cross-border activities to meet the demand from industry. However, challenges remain to the further improvement of the quality of higher education in Malaysia. Although the number of Malaysian foreign degree holders employed by the manufacturing industry (both existing and new recruits) is much lower than that of domestic university degree holders, they comprise 17% of all employees with a university degree in the E&E industry.[12] This is also the major industry that receives FDI, especially from Japan. Our analysis also implies that overseas educated Malaysian professionals in the manufacturing sector fare well in comparison to locally educated professionals or foreign professionals. Given that the field of study of Malaysian students in Japan was concentrated in engineering, it can be reasonably assumed that many of them decided to work in this sector after graduation and form an important segment of Malaysian employees with foreign university degrees in the manufacturing sector. In the following section the paper first examines how Malaysian students in Japan—a proportion of whom are HELP students—are financed and in which fields they are enrolled. Finally, it tries to estimate the proportion of students in publicly funded programs that include programs financed through Japanese ODA loans.

4.1 Publicly funded Malaysian students in Japan

According to JASSO (2009), the funding sources for foreign students in post-secondary education in Japan can be assigned to three main categories: Japanese government scholarships, foreign government scholarships (including ones based on Japanese

[12] Calculated based on PICS 2007. Of 5,185 employees with university degree holders, 861 employees hold foreign degrees.

ODA grants and concessional loans), and private funds. The vast majority of students, or around 90% of all foreign students, were privately funded between 2000 and 2009.[13] The following analysis adopts this categorization as used by JASSO.

Unlike the common trend, there are two distinct characteristics of Malaysian students in Japan.

Firstly, Malaysian government scholarships accounted for the support available to the largest proportion of Malaysian students in Japan between 2000 and 2009. For the period from 2005 to 2009 for which comparable data are available, 56% of Malaysian students enrolled in Japanese post-secondary education institutions were funded by the Malaysian government. This figure includes those who were financed through Japanese ODA concessional loans to the Malaysian government (Table 4). Another 11% were covered by Japanese government scholarships (grants provided by the Japanese Ministry of Education, Sports, and Science and Technology), and 33% by private funds.

Secondly, Malaysian students in Japan are mostly engaged in engineering, especially at the undergraduate level. Between 2005 and 2009, on average only two percent of foreign undergraduate students in Japan were Malaysians. However, among foreign students specialized in engineering, the proportion of Malaysian undergraduate students was 17% (Table 5). This figure reveals the high concentration of Malaysian students in this field. Among the Malaysian students, the proportion of engineering students (1,015) of all Malaysian undergraduate students (1,331) was 76% between 2005 and 2009. This indicates a high concentration of Malaysian students in engineering during this period, which is a distinct characteristic of Malaysian students in general.[14]

This predominance of the Malaysian government-funded students in engineering apparently matches Malaysia's long-standing priority of building high level human capital in

[13] Based on statistics of JASSO 2008-2009.
[14] Furthermore, Malaysian government-funded students in undergraduate engineering fields have a disproportionately large representation (87%) among all foreign government-funded students in undergraduate engineering programs.

science and technology, as stipulated in the Ninth Malaysian Plan (EPU 2006).

Furthermore, as Table 6 indicates, a relatively large proportion of engineering students who were funded by Malaysian government scholarships and who studied in Japan were those under the HELP or Look East Program.[15] Based on 2005 - 2008 JASSO data and JICA internal data, it is estimated that these two programs covered on average 39% of Malaysian government-funded students. However, except for 2005, these years came towards the end of the programs, thus, fewer students were covered by these programs in these years. During the peak years of these programs (i.e., from 1999 to 2005) around 500 to 700 students were covered. Given that these two programs funded 71% of all Malaysian government-funded students (609 students) in 2005, these two programs most likely covered at least half and probably a larger proportion of Malaysian government funded undergraduate students enrolled in Japan between 1999 and 2005.[16] Furthermore, as examined above, students funded by the Malaysian government comprised the largest group of Malaysian students in Japan and on average 76% of Malaysian students enrolled in Japanese undergraduate programs were in engineering. Thus, an examination of the first post-graduation activities—mainly focusing on employment or further study—of the Malaysian graduates who studied under these programs in Japan may shed some light on whether publicly funded cross-border higher education programs between Malaysia and Japan have been effective in yielding their intended outcomes over these periods. To put it differently, the following section will examine whether these programs achieved their intended objective of capacity building. Due to data limitations, the remainder of this paper examines the post-graduation activities (i.e., employment and further

[15] HELP is designed solely for engineering students and a large majority of the Look East students are also engaged in engineering. HELP and part of the Look East program (LEP) have been financed by Japanese ODA loans for students who entered the programs between 1995 and 2008. HELP1 students entered programs between 1993 and 2000, HELP2 between 2001 and 2006, and LEP between 1999 and 2003. HELP3 is an ongoing program. However, the main focus of this paper is on the HELP1 and 2 students since HELP3 had its first graduates only in March of 2010.

[16] After including the Japanese Ministry of Education "Monbusho" scholarships, Japanese ODA has either financed or funded more than half of all Malaysian students who were enrolled in Japanese tertiary education.

study) of the HELP graduates only

4.2 Labor market outcomes of the HELP participants

As discussed earlier, cross-border higher education programs are considered effective instruments for meeting the growing demand for higher-level human resources, but they also have the high risk of causing a brain drain for the sending countries. This section explores the questions of: (1) Whether Malaysian graduates who have completed undergraduate programs in Japan under HELP are successful in seeking jobs or continuing their studies; (2) Whether education at Japanese universities properly trains students so that they can obtain the relevant skills to satisfy the human resource needs of the industry concerned; and (3) Whether graduates return to Malaysia after completing their studies or continue to stay in Japan.

4.2.1 Employment

This section first examines (1) the types of post-graduation activities that the graduates of HELP were engaged in upon completion of their degree programs and then (2) compares these with (i) domestic public university graduates and (ii) overall foreign graduates from Japanese universities. Special attention is paid to graduates with engineering degrees at the first degree level.

Graduates of HELP1 and HELP2 entered the labor market between 1999 and 2008 if they graduated on time or they did not continue their studies. As discussed earlier, this was a period in which there was a rapid increase in the number of Malaysian higher education institutions. To reiterate an earlier statement, the number of graduates at the undergraduate level in technical fields increased by 142%, for masters degrees by 73% and for PhDs by 13% between 2002 and 2008.

Against this backdrop, what activities were HELP graduates engaged in immediately after graduation? Based on the exit data for HELP graduates (i.e., just around the time of their

graduation), the average rate of employment for HELP graduates between 1999 and 2008 is estimated to be 62 percent and for seven out of the ten years of the program the rates were either above or just below the average (Figure 5).[17] In the years 2003 and 2008, which were the years of global crises such as the SARS outbreak and more recently the global financial crisis, the rates dropped to 31% and 50%, respectively.

The year 2005 is an enigma as the employment rate dips to less than 52% without any apparent reason. As discussed in Section 3-2-1 above, in the first half of the 2000s decade, the number of Malaysian domestic higher education institutions increased dramatically and, as discussed in section 3.2.2, by 2005 they annually provided diplomas for over 10,000 engineering graduates. This could be a potential reason for the low employment rate in 2005 which might have caused excessive saturation in employment opportunities for engineers in the Malaysian labor market, although this seems to be a temporary phenomenon since the rate of employment for HELP graduates bounced back to 69% in 2006.

However, a substantial portion of HELP graduates pursued further studies, including years of lower employment. Consequently, the total percentage of graduates that were either employed or continued to study (at the post-graduate level) around the time of graduation is about 80%. If the data had been taken not at the moment of graduation but six months later, the percentage of HELP graduates employed would have been even higher since some students were only able to look for a job upon their return to Malaysia.[18]

As to the issue of whether HELP graduates have acquired the skills relevant to the manufacturing industries of Malaysia, the paper examines the sectors of the employers of HELP1 and 2 graduates. Of the 341 graduates who found jobs at the time of completing their degrees, 84% were employed in the manufacturing sector and Japanese firms were among the predominant employers of HELP graduates (Table7). In other words, by the time of graduation

[17] HELP2 was scheduled to be completed in 2008 but some students who repeated one year graduated in 2009. Here we used the data up to 2008 as many of the graduates did not participate in this exercise.
[18] Malaysian Ministry of Higher Education's graduate tracer study measures the were told that new recruitment for fresh graduates is an ongoing process.

about a half of the total number of students in HELP1 and HELP2 had obtained a job in the sector in which the HELP programs aimed to develop human resources. Japanese firms (either in Malaysia or Japan) were the main employers.

Previous tracer studies of HELP graduates also confirm that HELP graduates have faced relatively good employment prospects in the intended industries. However, the majority who participated in the HELP1 as graduates reportedly changed jobs within a year, although they stayed within the engineering field (PE Research Sdn Bhd. 2004). At the time of the survey in late 2004, over 80% worked as engineers, IT specialists, and architect/draughtsman while another 16% as managers and academicians, which seems to indicate that HELP1 graduates were in positions that were the objective of the program.

Next, how do HELP graduates fare when compared with domestic degree holders? Domestic public university graduates are selected for two reasons. Firstly, both HELP and domestic public university graduates are predominantly Bumiputra (the most numerous ethnic group in Malaysia). In addition, the Malaysian Ministry of Higher Education (MOHE) has conducted graduate tracer studies of the activities of public university graduates (within six months of obtaining a degree) just as YPM has collected data on HELP graduates.

Using the data from the MOHE tracer studies, this paper first reviews whether and to what extent domestic public university graduates obtained employment with companies affiliated to Japanese firms. Table 8 shows a breakdown of degree holders from public universities in technical fields by the types of firms (i.e., multinational corporations or MNCs, local firms, government affiliated firms, NGOs, independent, and others). MNCs are sub-divided according to whether or not they are affiliated with a Japanese company. Around 6.4% of domestic public university graduates that responded to the tracer study between 2006 and 2009 worked in companies affiliated to a Japanese firm. The corresponding figure for HELP graduates (1999-2008) was 78%.

Secondly, we compare the statistics for public university graduates with undergraduate

degrees in technical fields in 2002, 2003, and 2004. Among these graduates, 49%, 45%, and 54%, respectively, were employed within 3 to 6 months after graduation (EPU and World Bank 2007). The employment rates for HELP graduates in these same years were 57%, 31%, and 57%, respectively. Except for 2003, the employment rate for HELP graduates was no less than that of domestic public university graduates in technical fields.

In 2007, for which more detailed data is available, 63% of graduates in technical fields from domestic public higher education institutions were employed at the time of graduation and 5% continued their studies while the figures for HELP graduates are 64% and 25%, respectively. In other words, 68% of the domestic public university graduates were either employed or involved in further studies while 89% of HELP graduates were engaged in these activities. [19] Among domestic public university graduates, those who majored in electrical/electronics/telecommunications engineering (which are the fields most favored by HELP students) had the lowest employment rate of 57% compared with 70% for architecture and civil engineering (Figure 6).

Overall the above observations imply that most HELP graduates have been relatively well absorbed into the industries they intended to enter or have continued their studies. The fact that some graduates opted for further studies, instead of entering the labor market immediately after graduation, is also consistent with the human resources development strategy of Malaysia as it aims to increase the number of post-graduate degree holders, especially academic staff with a PhD My Brain15 program of the Ministry of Higher Education aims to increase the number of PhD holders to 18,000 by 2015 and to 60,000 by 2023 (EPU 2010). In practice, the percentage of Ph.D. holders among the total number of academic staff in public universities increased from 26.6% in 2005 to 35.9% in 2009.

Lastly, as indicative figures, the paper compares HELP2 graduates with the total

[19] One sample proportion test ($z=2.9345$, $p>0.05$). At the 95% confidence level, the percentage of the 07 HELP2 graduates will fall between 79% to 98%.

number of foreign graduates who obtained Japanese undergraduate degrees in any field of study between 2005 and 2008. This comparison indicates that HELP graduates tended to have a better chance of employment at the time of program completion. As Table 9 shows, among the foreign graduates residing in Japan, 39% were employed between 2005 and 2008, 28% pursued further studies, and 33% were engaged in other activities or their situation was unknown. In contrast, more HELP2 graduates were employed but few were engaged in post-graduate studies.[20] Nevertheless, HELP programs started to cover masters degrees from HELP2 and PhDs in HELP3, which is consistent with the policy of the Malaysian government to increase higher-level expertise in science and technology as stipulated in the Ninth 5-year Plan (EPU 2006).

4.2.2 Location of the work (brain drain)

As discussed earlier, the issue of the emergence of a brain drain is not straightforward. Earlier literature indicates the rather detrimental effects of the migration of skilled labor for the economic well-being of developing countries (the so-called brain drain), especially if those who stay abroad have skills that are highly valued domestically (Bhagwati 2010). This could deprive developing countries of human resources that they really need. In their analysis of international migration according to education attainment, Docquier and Marfouk (2006) analyzed a selection indicator for emigrants (i.e., the proportion of skilled emigrants within the total emigration stock). They found that Malaysia had high selection rates, 59.2%, which means that a relatively high percentage of emigrants among the total emigration stock are skilled workers, although Malaysia did not have such a high emigration rate in comparison to other countries in the study.

However, more recent literature argues for the benefits of skilled migration to the

[20] Caution is required in this interpretation as the data for general foreign students in Japan is for all subjects while HELP graduates are mainly in engineering.

sending countries. In Malaysia, efforts have been made to channel the knowledge base of Malaysian talent abroad based on the National Brain Gain Programme at the Ministry of Science, Technology, and Innovation (MOSTI). In 2006 it aimed to "fast-track Malaysia's transition to an innovation-based economy, by leveraging the talent pool of the Malaysian diaspora and/or foreign researchers, scientists, engineers and technopreneurs (RSETs) residing abroad through the offer of incentives for mutual benefit" (MOSTI. Brain Gain web site).

Cross-border higher education could also lead to the exodus of intellectual resources. Rather than arguing for or against skilled migration, here we explore whether HELP programs have encouraged graduates to work in Japan immediately after graduation. The available data seems to confirm the above-mentioned claim that cross-border higher education entices skilled individuals to migrate is true for foreign graduates from Japanese higher education institutions in general (all subjects), but less so for HELP graduates (mainly engineering).[21] Overall, more than a half of the foreign graduates (at the undergraduate level) stayed on in Japan to work or to engage in activities including post-graduate studies (Tables 9 and 10). Between 2005 and 2008, 84% of the graduates who obtained jobs immediately after their graduation were employed in Japan. In comparison, only 28% of HELP graduates stayed in Japan. Of the HELP graduates, 57 to 96% returned to Malaysia to work. Figure 7 indicates the proportion of foreign graduates issued with Japanese work permits of the total number of foreign students by country. A work permit is used as a proxy indicator for post-graduate activities in Japan in the absence of a more direct measure. The proportion of Malaysian students staying on in Japan is much smaller than for Chinese students and is at a similar level to that of Korean, Taiwanese and Vietnamese students. Around 90% of HELP graduates returned to Malaysia after completing the programs in Japan from 1999 to 2005.

A noticeable change occurred in 2006 when the number of graduates staying in Japan

[21] Again caution is required in this interpretation as the data for general foreign students in Japan is for all subjects whereas HELP graduates are mainly in engineering. In addition, some countries such as China have a disproportionately large student representation in Japan.

after receiving their degree increased dramatically. Less than 70% of graduates returned to Malaysia after graduation between 2006 and 2008 (Table 10 above). In general, the decision by a graduate as to where to work is affected by factors such as the immigration regulations and labor market conditions in the host country as well as the availability of scholarships for further studies.[22] In the case of HELP graduates, the relaxation of immigration policies from 2003 for foreign graduates may have affected their post-graduation behavior (Immigration Bureau of Japan 2004).[23] In addition, labor market conditions in the home and host countries has an influence on their decision. An increasing number of firms in Malaysia also encourage graduates to work in Japan prior to returning to Malaysia. The MOHE report on engineering education mentioned earlier also recommends that engineering graduates work overseas before coming home (MOHE n.d.).

Depending on the level of the country's human resources needs, working in a foreign country immediately after graduation does not necessarily mean a loss for the home country if these graduates can improve their knowledge and skills during their stay in the host country and eventually go home or contribute to technology transfer through international networks. As we saw above, the business community often complains that university graduates are not equipped with the relevant skills. Perhaps the question that is not adequately answered, but needs further examination, is whether staying overseas after graduation contributes to improving human capital at home.

[22] For instance, Baruch and others identified the following three potential factors: the presumptions of the students regarding cultural differences and the labor market, how they are able to adjust to the host country, and their family ties both in their host and home country (Baruch, Budhwar, and Khatri 2006)

[23] The Ministry of Justice of Japan reported that it started to approve a change in the visa status of foreign graduates from February 2004 to enable a short stay extension (of up to 180 days) if they were searching for a job and if they had a recommendation from their university . Based on Kozo Kaikaku Tokku no Dai2jian ni taisuru Seifu no Taio Hoshin (decision made on 2/27/2003 by Kozo Kaikaku Tokku Suishin Honbu).

5. Conclusions

This paper explores the questions of how and to what extent cross-border higher education programs in engineering, funded by the Government of Malaysia and financed from Japanese ODA loans, have met Malaysian industry's needs in the context of changing economic and educational circumstances. In particular, this paper examines the employment status (employment potential, skills relevance, and brain drain) of HELP graduates at the time of program completion.

To sum up, the Malaysian government policies on human resources development have dramatically increased the capacity of the higher education system over the past two decades through domestic and cross-border activities to meet the demand from the manufacturing sector. During this period, Malaysia also became a preferred location for foreign direct investment and Japan is one of the main investors, especially in the E&E industry. The fact that a large number of Malaysian students in Japan are publicly funded and Japanese ODA loans finance some of these government scholarship funds suggests that public funds for human resources development, together with the flow of Japanese FDI into the manufacturing sector, have played complementary roles in the development of highly skilled human resources for the E&E industry, which is the largest manufacturing industry in Malaysia. With regard to the higher education front, Malaysia has also made great strides and the enrollment of engineering undergraduate students in domestic higher education institutions increased twofold between 2002 and 2009. Thus, the total output of technical undergraduate degree holders by domestic higher education institutions also increased by 142% during this period. However, challenges remain to further improve the quality as a survey of Malaysian manufacturing companies seems to indicate that there is a gradual shift of issues related to high level human resources development from quantity to quality. Our analysis of the 2007 Productivity and Investment Climate Survey indicates that the manufacturing sector hires a certain number of foreign university graduates and, among the firms with engineers, overseas educated

Malaysian professionals fare well in comparison to locally trained professionals or foreign professionals. Given that Malaysian students in Japanese higher education are concentrated in engineering, we consider that they form a part of this group.

Despite the changing contexts of the Malaysian economy and higher education over the past decade, an analysis of the activities of the HELP graduates immediately after graduation indicates that the cross-border higher education programs between Malaysia and Japan achieved their intended outcomes in terms of post-graduation employment. Overall, HELP graduates have been absorbed into the manufacturing sector where the program intends to provide human resources and there is no labor market saturation in terms of undergraduates with engineering degrees, which seems consistent with the previous findings from the company survey as well as the Malaysian government projections. Our analysis of the Ministry of Higher Education Tracer Study (2006-2009) indicates that HELP graduates are more or less comparable with domestic public undergraduate degree holders from domestic public universities in terms of their rate of employment.

However, our findings suggest that HELP may still be causing a brain drain. Since 2006, more HELP graduates and other foreign graduates seemed to have decided to stay in Japan. This is probably due to the Japanese government's immigration policy. Although this issue is the subject of further investigation in a subsequent paper, the broader context of the social and economic conditions in the host and sending country and the immigration policy of the host country may influence decisions made by graduates to stay or return home.

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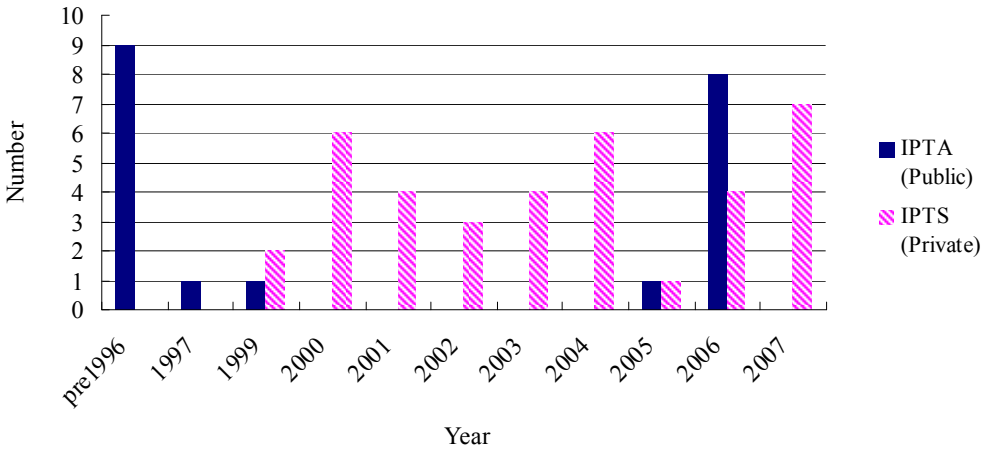
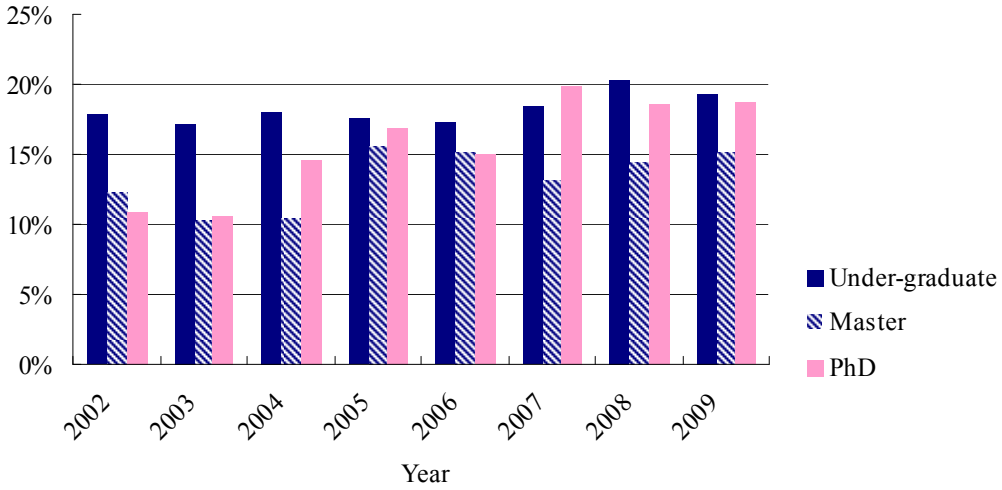
Figure 1. Number of HEIs with university status by the year of establishment (as of 2007)



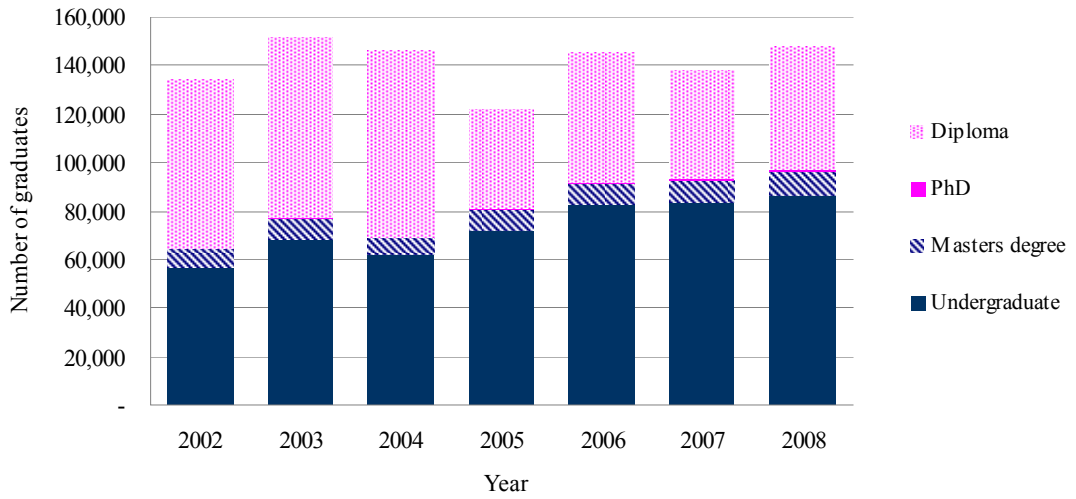
Source: Table 2.27 (IPTA), 3.42 (IPTS), Malaysia Higher Education Statistics, Ministry of Higher Education
Data downloaded from www.mohe.gov.my/web_statistik/#data_macro on 7/9/10
Note: IPTA (INSTITUT PENGAJIAN TINGGI AWAM): Public University
IPTS(INSTITUT PENGAJIAN TINGGI SWASTA):Private University

Figure 2. Share of students enrolled in technology-related fields to total enrollment at each level (%), 2002-2009



Note : Technology-related fields include engineering, architecture, manufacturing etc.
For details, see individual table in original source.
Source: Calculation by the authors using the data from Malaysia Higher Education Statistics, Ministry of Higher Educatiion
Data downloaded from www.mohe.gov.my/web_statistik/#data_macro on 7/9/10

Figure 3. Number of higher education graduates in Malaysia according to the level for the period 2002-2008



Source: Malaysia Higher Education Statistics, Ministry of Higher Educatiion. Data downloaded from www.mohe.gov.my/web_statistik/statistik_pdf_2008_05/data_makro_1-3.pdf on 7/9/10

Table 1. Annual growth in the number of students from the top 10 sending countries for the period 2000-2008 (outbound mobile students)

	No. of students in 1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	No. of students in 2008
China	136,648	12%	14%	32%	36%	16%	11%	0%	3%	5%	440,883
India	50,976	13%	20%	37%	19%	13%	10%	-1%	10%	11%	170,256
Republic of Korea	66,006	6%	3%	17%	6%	5%	4%	4%	4%	7%	112,588
Germany	53,812	2%	4%	7%	5%	-10%	11%	9%	10%	8%	83,524
United States	41,339	5%	9%	8%	-3%	-3%	3%	3%	4%	-4%	50,728
Japan	58,825	2%	-4%	12%	1%	-5%	4%	-8%	-8%	-8%	50,380
Malaysia	49,485	-18%	-2%	6%	6%	-1%	-2%	0%	8%	3%	47,395
France	51,923	4%	4%	5%	2%	-18%	5%	3%	2%	-16%	45,191
Canada	29,715	2%	3%	18%	4%	2%	8%	3%	1%	1%	44,883
Russian Federation	25,973	8%	5%	18%	6%	2%	4%	6%	4%	3%	43,982

Note: This table sorted by number of students in 2008.

Source: Calculation by the author using data from the UNESCO Institute for Statistics (UIS) database

Table 2. Malaysian students studying abroad: Top 5 countries and total, 2000-2007

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Australia	12,869	n.a.	17,574	19,431	16,094	15,552	15,358	17,691	18,576
United Kingdom	10,351	9,193	9,011	9,715	11,806	11,474	11,448	11,811	11,727
United States	8,377	6,761	7,395	6,595	6,483	6,415	5,711	5,398	5,434
Japan	1,956	1,747	1,613	1,612	1,841	1,915	2,009	2,052	2,012
New Zealand	1,178	1,060	893	831	1,062	1,190	n.a.	1,727	1,942
Total (All countries)	40,611	39,653	41,896	44,249	43,693	42,854	42,716	45,952	47,395

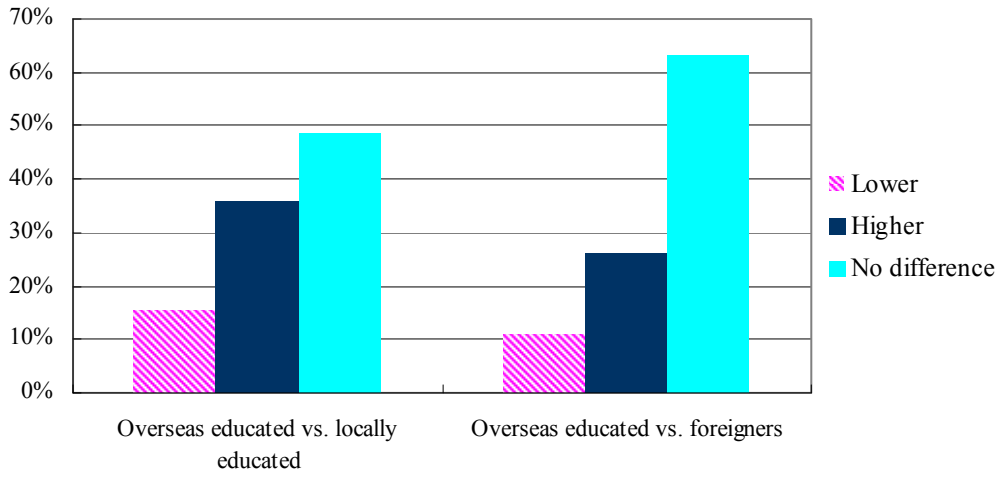
Source:UNESCO Institute for Statistics (UIS) database

Table 3. Share of newly recruited university degree holders within each industry in 2006

Industry	Educated locally (univ grad)	Educated abroad (univ grad)	Foreigners (univ grad)	Total
	% within Industries			
Food processing	85%	14%	2%	100%
Textiles	85%	12%	3%	100%
Garments	88%	13%	0%	100%
Chemicals	81%	14%	5%	100%
Rubber and plastics	93%	5%	2%	100%
Machinery and equipment	69%	17%	14%	100%
E&E	87%	11%	2%	100%
Electric applian	*96%*	*3%*	*2%*	*100%*
Electronics	*79%*	*19%*	*2%*	*100%*
Auto parts	75%	18%	6%	100%
Wood and funiture	85%	4%	11%	100%
Total	86%	11%	3%	100%

Source: Calculation by the authors using the data from Productivity and Investment Climate Survey(PICS)2 2007, World Bank

Figure 4. Comparison of the performance of professionals by the type of education in 2006



Note: This table only shows the firms with at least one engineer.
Source: Calculation by the authors using the data from Productivity and Investment Climate Survey (PICS)2 2007, World Bank

Table 4. Number of Malaysian students in Japan by fund type, 2000-2009
All levels of post-secondary education (excluding short-term exchange students)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	**2000-2004**	**2005-2009**
Japanese government scholarships	276	265	253	276	255	245	245	254	230	209	14%	11%
Malaysian government scholarships	1,033	923	965	1,007	841	1,106	1,149	1,195	1,300	1,395	50%	56%
Private funds	547	615	667	719	914	737	738	672	704	749	36%	33%
Total	1,856	1,803	1,885	2,002	2,010	2,088	2,132	2,121	2,234	2,353	100%	100%

Note: The methods of data collection has changed since 2004, thus, not compatible with the data before 2004. All levels means post graduate, undergraduate, and other tertiary education such as junior colleges

Note: The data collection methods adopted between 2000 and 2004 are not uniform, thus the figures are indicative figures for the 2005-2009 data and exclude short-term exchange students
Source: 2005-2009: Japan Student Service Organization (JASSO). Unpubli

Table 5. Number of Malaysian undergraduate students in Japan and the share in all foreign undergraduate students by fund type and subject, 2005-2009

	All Subjects	Engineering	Share of Engineering
	Ave.2005-09	Ave.2005-09	Ave.2005-09
Malaysian students			
Japanese government scholarships	67	41	62%
Proportion of the Total Number of Foreign Students	5%	9%	
Foreign government funds	916	860	94%
Share in all foreign students	81%	87%	
Private funds	348	114	33%
Share in all foreign students	1%	3%	
Total	1,331	1,015	76%
Share in all foreign students	2%	17%	

Note: The number of students includes both the new entrants and the existing students

Source: Japan Student Services Organization(JASSO) unpublished data received 5/26/10 and 8/23/10 revised version

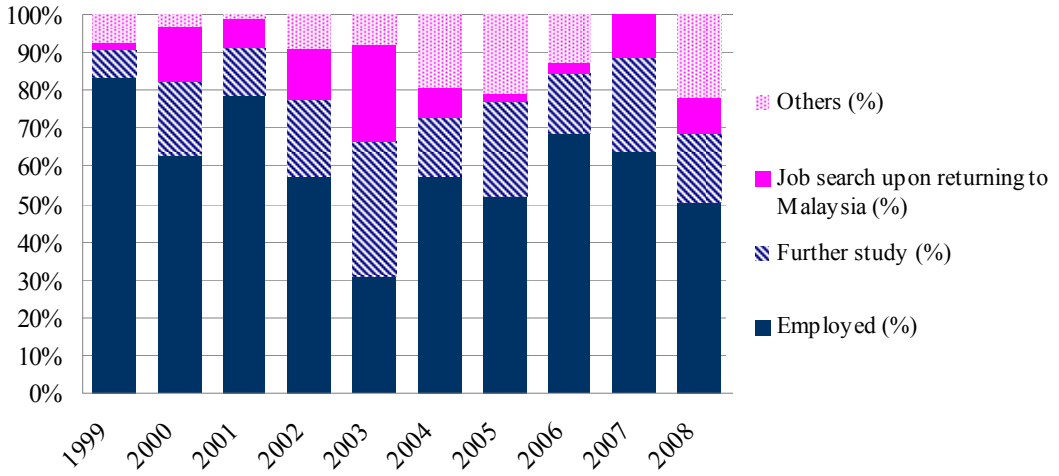
Table 6. Proportion of students receiving Japanese ODA loans (HELP and LEP) of the total number of undergraduate students in Japan funded by Malaysian government scholarships (excluding short-term exchange students), 2005-2008

Types of Funds	All Subjects					Engineering				
	2005	2006	2007	2008	Ave. 2005-08	2005	2006	2007	2008	Ave. 2005-08
Proportion of students receiving HELP funds as a percentage of those receiving Malaysian government scholarships	21%	12%	6%	8%	12%	23%	13%	7%	8%	13%
Share of LEP to Malaysian government scholarships (%)	50%	33%	17%	0%	24%	55%	35%	18%	0%	26%
Share of HELP&LEP to Malaysian government scholarships (%)	71%	45%	24%	8%	36%	78%	48%	25%	8%	39%

Note: HELP=Higher Education Loan Projects, LEP= Look East Programs
LEP data includes only those years that are covered by yen loan for the purpose of this study.Malaysian government has been sending students to Japanese universities through LEP since 198

Source: Calculation by the authors using the data from Japan Student Services Organization(JASSO) unpublished data. Received on May 26, 2010 and YPM and JICA internal data

Figure 5. Activities of HELP1 and 2 graduates after graduation (undergraduate-level), 1999-2008



Note: The category of "Others" consists mostly of graduates for whom there is no or only limited information (they have returned to Malaysia or are undecided about their plans).
Source: Calculation by the authors using the data from YPM Yayasan Pelanjaran Mara (YPM)

Table 7. Employment of HELP1 and 2 graduates (undergraduate level) by sector and type of employer, 1999-2008

Year of graduation	Sector				Type of company				No. of graduates who employed
	Manufacturing	Service	Others	Total	Japanese	Malaysian	Others	Unknown	
1999	78%	20%	2%	100%	78%	20%	0%	2%	45
2000	76%	24%	0%	100%	71%	24%	0%	5%	42
2001	87%	13%	0%	100%	89%	10%	0%	2%	62
2002	96%	4%	0%	100%	96%	4%	0%	0%	25
2003	100%	0%	0%	100%	75%	17%	8%	0%	12
2004	93%	7%	0%	100%	72%	24%	3%	0%	29
2005	63%	37%	0%	100%	59%	41%	0%	0%	27
2006	91%	9%	0%	100%	82%	18%	0%	0%	44
2007	79%	18%	4%	100%	71%	25%	0%	4%	28
2008	81%	19%	0%	100%	78%	22%	0%	0%	27
Total	84%	16%	1%	100%	78%	20%	1%	1%	341

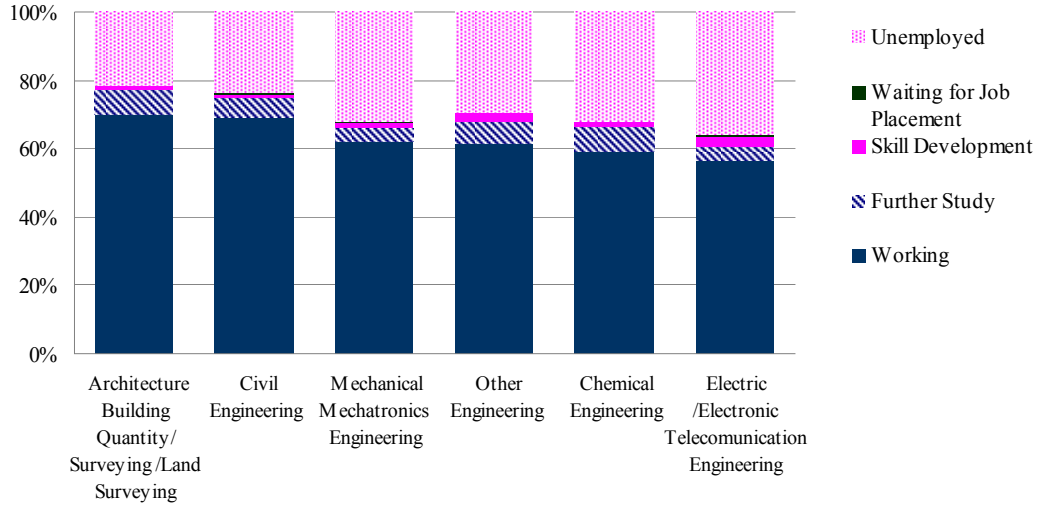
Source: Calculation by the authors using the data from YPM Yayasan Pelanjaran Mara (YPM)

Table 8 Employment of Malaysian domestic public university graduates (undergraduate-level, technical fields) by type of employers, 2006-2009

Year of graduation	Multinational Corporations (MNC)			Local	Government related	NGOs	Independent	Others	Total**
	MNC total	of which, affliated with Japan*							
		Number	Share in total						
2006	1,718	331	7.2%	2,731	0	0	137	26	4,612
2007	2,196	450	7.1%	3,884	0	0	182	58	6,320
2008	2,182	461	6.8%	3,901	416	77	184	45	6,805
2009	1,156	242	4.4%	3,818	262	33	180	52	5,501
Total	7,252	1,484	6.4%	14,334	678	110	683	181	23,238

Note:* The determination as to whether or not the company was Japanese was made by the authors using the data on the name and address of the company.
** The number of participating universities and the response rates vary according to the year.
Source: Calculation by the authors using the data from "Malaysian Ministry of Higher Education's Graduate Tracer Study."

Figure 6. Activities of Malaysian domestic public university graduates after graduation (undergraduate-level in technical fields), 2007



Source: Ministry of Higher Education. Government of Malaysia (2008) Laporan Kajian Pengesanan Graduan (Graduate Tracer Study) 2007, Table 4.14b.3vols. Putrajaya

Table 9. Post graduation activities of Japanese university graduates (undergraduate-level), 2005-2008

	Post Graduation Activities				Location of Employment for the Employed		
	Total graduates	Employed	Further study	Others	Home countries	Japan	Other locations
2005	8,640	33.2%	32.4%	34.5%	20.9%	78.4%	0.8%
2006	11,579	36.8%	28.2%	35.1%	16.4%	83.2%	0.4%
2007	12,196	39.7%	27.3%	33.0%	13.6%	86.2%	0.2%
2008	12,059	42.8%	25.6%	31.6%	12.4%	87.2%	0.4%
Total	44,474	38.5%	28.0%	33.4%	15.2%	84.4%	0.4%

Source:Gaikokujin Ryugakusei Shinro Jokyo Gakui Jokyo Chosa Kekka (Table1. Gaikokujin Ryugakusei Shinro Jokyo Chosa Kekka), Japan Student Services Organization(JASSO),Various years

Note: The calendar year is used to denote the graduation year rather than the academic year (i.e., the year that they actually graduated).
The category of "Others" mostly includes graduates for whom there is no information or graduates who are looking for a job.

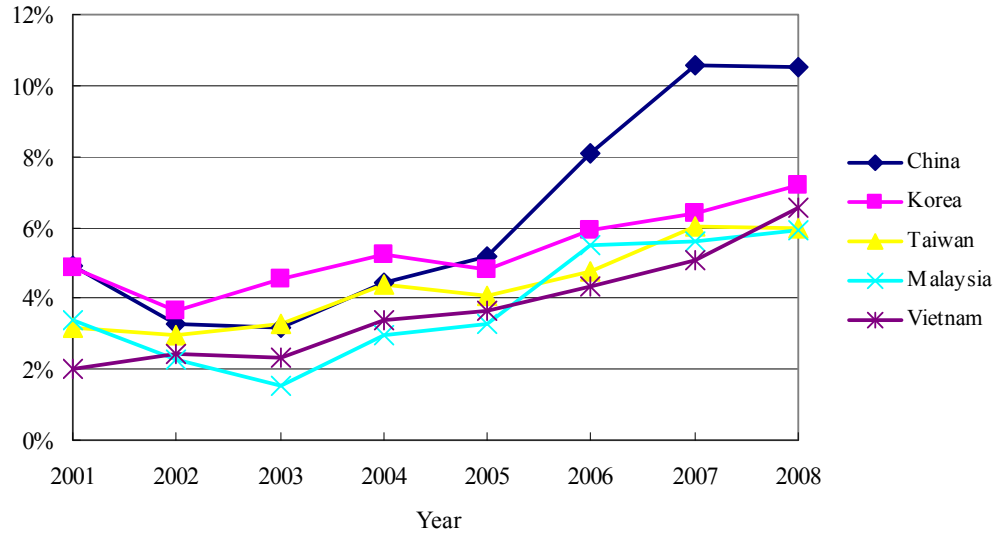
Table 10. Employment of HELP1 and 2 graduates (undergraduate-level) by location of employers (%), 1999-2008

Graduation year	Location			Number of graduates who are employed
	Malaysia	Japan	Unknown	
1999	91%	9%	0%	45
2000	90%	7%	2%	42
2001	94%	5%	2%	62
2002	88%	12%	0%	25
2003	83%	17%	0%	12
2004	97%	3%	0%	29
2005	96%	4%	0%	27
2006	70%	30%	0%	44
2007	57%	43%	0%	28
2008	67%	33%	0%	27
Total	84%	15%	1%	341

Note: 35% of the firms located in Japan have a Malaysian branch.

Source: Calculation by the authors using the data from YPM Yayasan Pelanjaran Mara (YPM)

Figure 7. Proportion of the number of work permits issued to all foreign graduates according to their nationality: Top 5 nationalities of the recipients of permits, 2001-2008

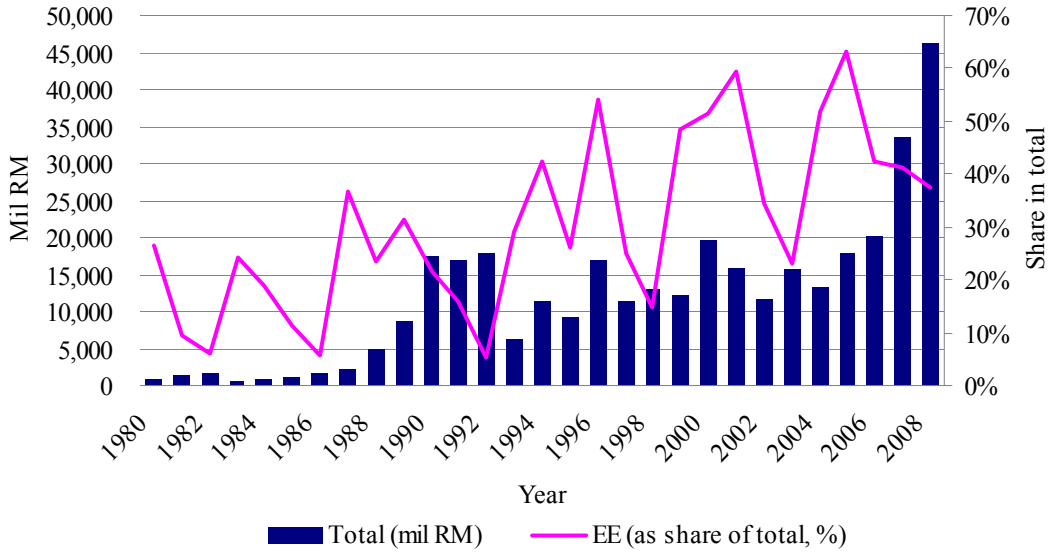


Note: The figures in this table refer to the percentage by nationality of students who obtained a work permit of all foreign students in Japan.

Source: Japan Student Services Organization(JASSO) for number of students, Ministry of Justice Japan for work permits

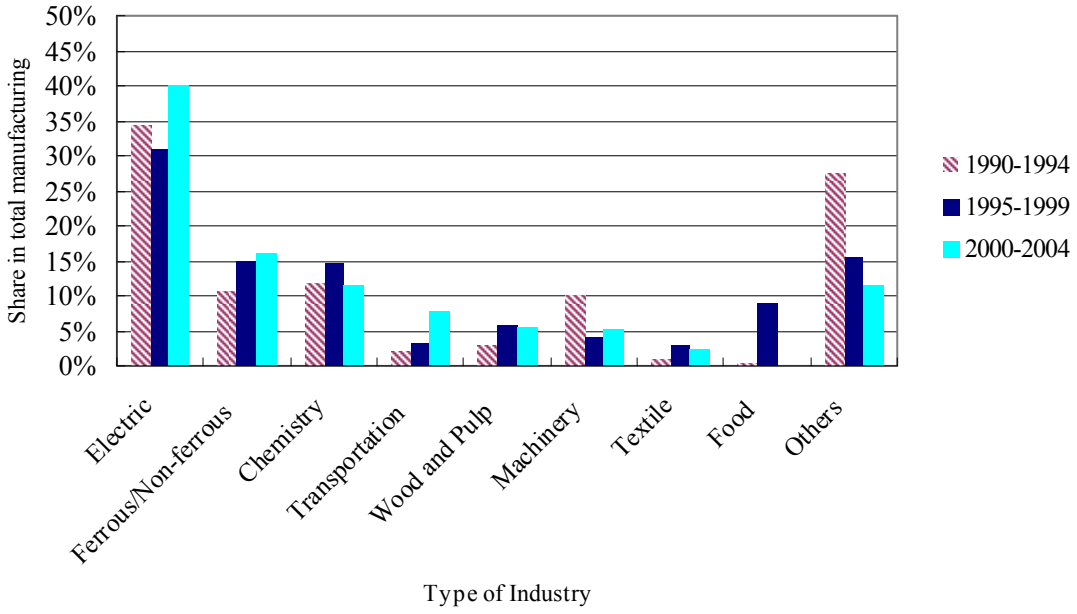
ANNEX

Annex 1. Proportion of the total approved foreign investment accounted for by the electronics and electrical industry (EE) in Malaysia, 1980 - 2008



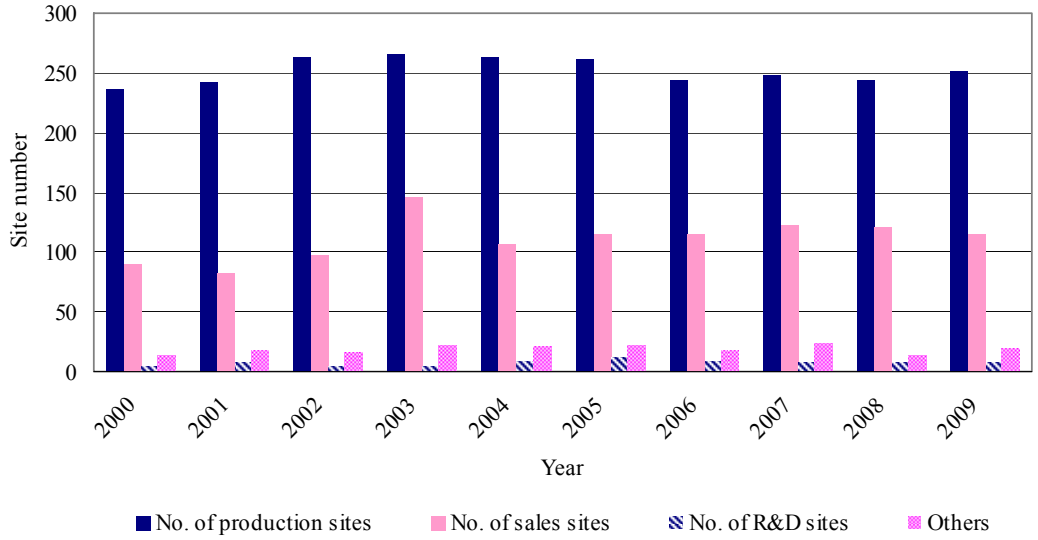
Source:Malaysian Industrial Development Agency(MIDA), Approved Projects by Industry
Data downloaded from www.epu.gov.my/econindicators on 6/16/10

Annex 2. Japanese Foreign Direct Investment (FDI) in Malaysia by industry (5-year average in manufacturing), 1990-2004



Source: Taigai Oyobi Tainai Chokusetsu Toshi Jokyo, Ministry of Finance of Japan
Downloaded from http://www.mof.go.jp/1c008.htm on 5/21/10

Annex 3. Number of various sites of Japanese firms in Malaysia by type, 2000-2009



Source:Unpublished data from Japan Bank for International Cooperation (JBIC)

Annex 4. Perception by Japanese companies of the ranking of potentially suitable overseas business locations: Comparison between Malaysia, Thailand and Vietnam, 1995-2009

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Thailand	2	2	4	3	3	3	2	2	2	2	2	4	4	5	4
Malaysia	6	6	9	8	8	5	9	9	9	10	11	11	11	12	10
Vietnam	5	5	6	9	6	9	6	5	4	4	3	3	3	3	3

Note: Ranking Most preferred=1

Source: Wagakuni Seizogyo Kigyo no Kaigai Jigyo Tennkai ni Kansuru Chosa Hokoku, Japan Bank of International Cooperation(JBIC), Various issues

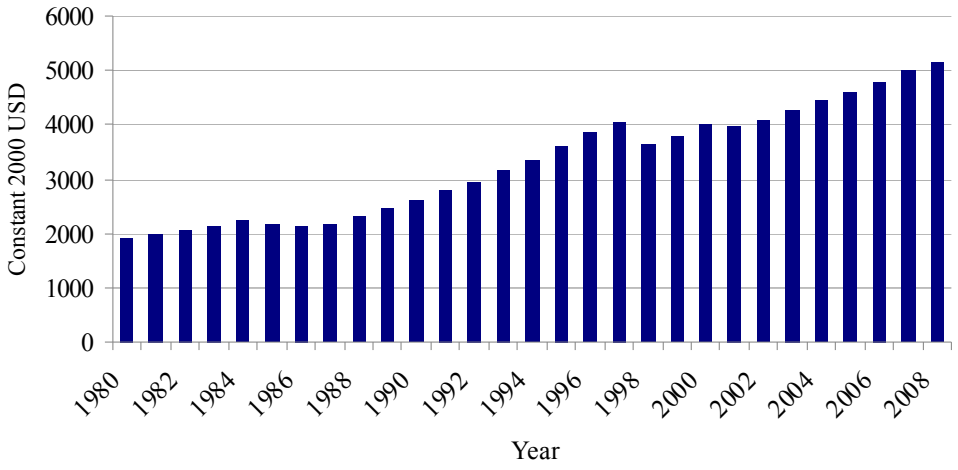
Annex 5. Proportion of outbound mobile students of the total number of students in China, Indonesia, Malaysia, 2000-2008

		2000	2001	2002	2003	2004	2005	2006	2007	2008
China	Enrolment in total tertiary	7,364,111	9,398,581	12,143,723	15,186,217	18,090,814	20,601,219	23,360,535	25,346,279	26,691,696
	Outbound mobile students	153,598	175,743	231,383	315,668	365,718	405,807	407,808	421,433	440,883
	Outbound mobility ratio	2.1%	1.9%	1.9%	2.1%	2.0%	2.0%	1.7%	1.7%	1.7%
India	Enrolment in total tertiary	9,404,460	9,834,046	10,576,653	11,295,041	11,852,936	11,777,296	12,852,684	14,862,962	n.a.
	Outbound mobile students	57,723	69,305	94,821	112,752	127,367	140,037	139,153	153,491	170,256
	Outbound mobility ratio	0.6%	0.7%	0.9%	1.0%	1.1%	1.2%	1.1%	1.0%	n.a.
Malaysia	Enrolment in total tertiary	549,205	557,118	632,309	725,865	731,077	696,760	737,267	805,136	n.a.
	Outbound mobile students	40,611	39,653	41,896	44,249	43,693	42,854	42,716	45,952	47,395
	Outbound mobility ratio	7.4%	7.1%	6.6%	6.1%	6.0%	6.2%	5.8%	5.7%	n.a.

Note: The "Outbound mobility ratio" refers to the proportion of mobile students coming from a country/region as a percentage of all the tertiary students in that country/region.

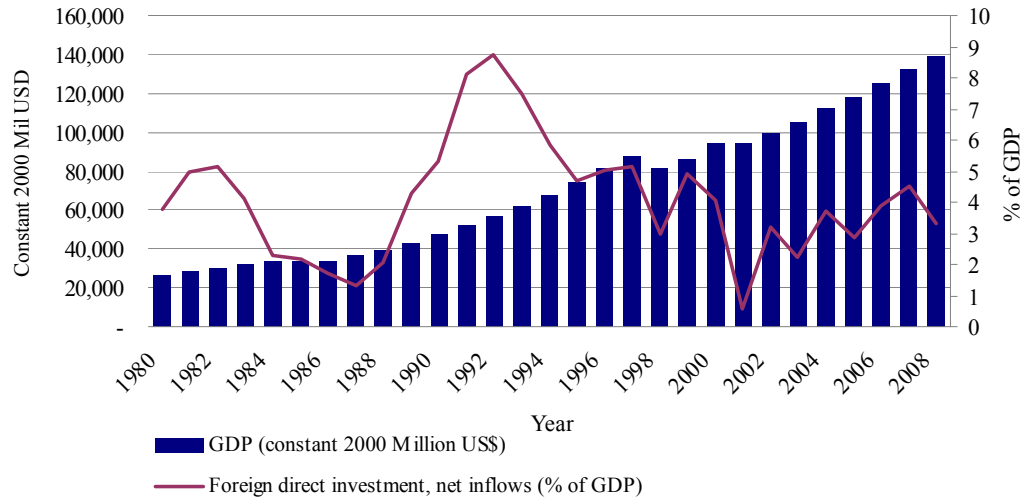
Source:UNESCO Institute for Statistics (UIS) database

Annex 6. Malaysia GDP per capita, 1980-2008



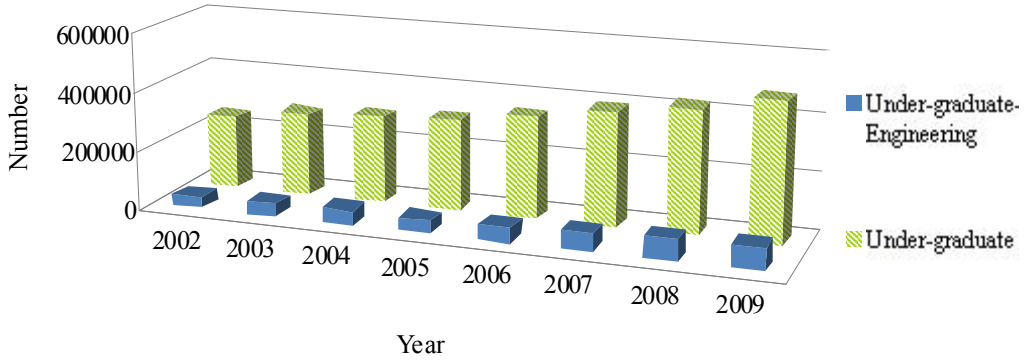
Source:World Development Indicators (WDI)
Data downloaded from http://databank.worldbank.org on 6/16/10

Annex 7. Malaysian GDP and % of foreign direct investment net inflows to GDP, 1980-2008



Source:World Development Indicators (WDI)
Data downloaded from http://databank.worldbank.org on 5/20/10

Annex 8. Number of students enrolled in engineering degree programs, 2002-2009



Source: Calculation by the authors using the data from Malaysia Higher Education Statistics, Ministry of Higher Educatiion
Data downloaded from www.mohe.gov.my/web_statistik/#data_macro on 7/9/10

Annex 9. Post graduation activities of Japanese university graduates (undergraduate-level), 1980-2005

	New graduates	Advancing to higher-level courses	Entering employment (1)	Clinical training and candidates	Continuing to study at specialized training colleges,etc	Entering provisional employment (2)	Others (3)	Deceased & unknown	Advancing to higher-level courses while being employed (recounted)	Advancement rate (4) (%)	Employment rate (5) (%)
1980	378,666	16,815	285,056	5,296	*	*	36,478	35,021	73	4.4	75.3
1985	373,302	22,056	288,272	6,920	*	*	33,488	22,566	71	5.9	77.2
1990	400,103	27,101	324,164	7,307	*	3,645	22,348	15,538	56	6.8	81.0
1995	493,277	46,329	330,998	6,732	*	9,280	67,844	32,094	13	9.4	67.1
2000	538,683	57,663	300,687	5,929	*	22,633	121,083	30,688	31	10.7	55.8
2001	545,512	58,662	312,450	6,628	*	21,514	116,396	29,862	21	10.8	57.3
2002	547,711	59,676	311,471	6,979	*	23,205	118,892	27,488	24	10.9	56.9
2003	544,894	62,251	299,925	8,184	*	25,255	122,674	26,605	62	11.4	55.1
2004	548,897	64,610	306,338	8,049	12,412	24,754	110,035	22,699	76	11.8	55.8
2005	551,016	66,108	329,045	7,903	12,061	19,507	97,994	18,398	80	12.0	59.7
For 2005											
Male	318,447	48,206	180,115	5,174	6,540	9,725	57,450	11,237	19	15.1	56.6
Female	232,569	17,902	148,930	2,729	5,521	9,782	40,544	7,161	61	7.7	64.1
National Univ.	101,248	33,484	45,792	4,063	1,295	1,684	13,290	1,640	8	33.1	45.2
Local Univ.	22,772	3,536	14,008	633	294	268	3,894	139	2	15.5	61.5
Private Univ.	426,996	29,088	269,245	3,207	10,472	17,555	80,810	16,619	70	6.8	63.1
Humanities	92,504	5,172	54,382	2,932	5,443	20,806	3,769	3,769	17	5.6	58.8
Social science	215,809	7,645	141,119	0	4,798	7,115	45,047	10,085	16	3.5	65.4
Science	19,250	7,982	7,999	0	227	265	2,434	343	0	41.5	41.6
Engineering	97,931	31,071	54,496	0	1,164	934	9,319	947	0	31.7	55.6
Agriculture	16,015	4,119	9,057	0	274	415	1,941	209	0	25.7	56.6
Health	32,960	4,114	17,330	7,903	196	116	2,855	446	16	12.5	52.6
Mercantile marine	150	13	55	0	76	0	6	0	0	8.7	36.7
Home economics	12,438	474	9,207	0	276	636	1,759	86	7	3.8	74.1
Education & Teacher Training	31,451	2,907	18,727	0	785	2,182	5,983	867	18	9.2	59.6
Arts	15,772	1,582	6,148	0	809	1,604	4,504	1,125	0	10.0	39.0
Others	16,736	1,029	10,525	0	524	797	3,340	521	6	6.1	62.9

Note: (1) Including those advancing to graduate school, university and junior college, etc.

(2) Including those continuing to study at a specialized training college, various established types of schools or any other type of school, other than those accounted for in the column "Advancing to higher-level courses",thus remaining in a special non-degree course and studying abroad.

(3) Including those involved in household work, etc.

(4) Including those advancing to higher-level courses while being employed.

(5) The single asterisk symbol * indicates that these graduates are included in the category of "Others"

Source:Ministry of Education, Culture, Sports, Science and Technology (MEXT) Japan, School Basic Survey, Data downloaded from http://www.mext.go.jp/english/statist/index11.htm on 9/8/10

Annex 10. Number of Malaysian students in Japan and their proportion of all foreign students by type of funding source and subject, 2005-2009

Undergraduate-level

By Types of Funds	All Subjects										Engineering										Share of Engineering in All Subjects	
	Malaysian students					All foregin students					Malaysian students					All foregin students					Malaysia	All foreign students
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005-2009	2005-2009
Japanese government scholarships	78	72	72	62	49	1,345	1,317	1,316	1,293	1,272	48	47	47	37	28	450	458	461	478	476	62%	36%
Foreign government funds	859	892	883	949	998	925	985	976	1,385	1,582	779	845	834	892	949	795	877	867	1,185	1,341	94%	87%
Private funds	404	364	315	309	348	53,165	51,733	50,097	49,650	51,918	142	120	105	103	98	4,347	4,625	4,264	4,521	4,586	33%	9%
Total (undergraduate)	**1,341**	**1,328**	**1,270**	**1,320**	**1,395**	**55,435**	**54,035**	**52,389**	**52,328**	**54,772**	**969**	**1,012**	**986**	**1,032**	**1,075**	**5,592**	**5,960**	**5,592**	**6,184**	**6,403**	76%	11%
Malaysian share in all foreign students	**2%**	**2%**	**2%**	**3%**	**3%**						**17%**	**17%**	**18%**	**17%**	**17%**							

Post graduate-level

By Types of Funds	All Subjects										Engineering										Share of Engineering in All Subjects	
	Malaysian students					All foregin students					Malaysian students					All foregin students					Malaysia	All foreign students
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005-2009	2005-2009
Japanese government scholarships	164	173	182	168	160	7,695	7,699	7,743	7,725	7,930	72	76	80	84	74	2,260	2,315	2,420	2,525	2,696	46%	31%
Foreign government funds	43	46	77	124	172	280	429	628	873	1,243	13	34	37	85	121	35	95	131	221	380	63%	25%
Private funds	192	207	214	212	200	21,384	21,867	22,141	22,640	24,420	101	121	123	114	112	4,581	4,748	5,075	4,863	5,217	56%	22%
Total (Post graduate)	**399**	**426**	**473**	**504**	**532**	**29,359**	**29,995**	**30,512**	**31,238**	**33,593**	**186**	**231**	**240**	**283**	**307**	**6,876**	**7,158**	**7,626**	**7,609**	**8,293**	53%	24%
Malaysian share in all foreign students	**1%**	**1%**	**2%**	**2%**	**2%**						**3%**	**3%**	**3%**	**4%**	**4%**							

Others

By Types of Funds	All Subjects										Engineering										Share of Engineering in All Subjects	
	Malaysian students					All foregin students					Malaysian students					All foregin students					Malaysia	All foreign students
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005-2009	2005-2009
Japanese government scholarships	3	0	0	0	0	551	557	557	536	540	1	0	0	0	0	395	413	389	378	375	33%	71%
Foreign government funds	204	211	235	227	225	206	211	377	379	318	200	209	211	208	223	202	209	211	210	224	95%	71%
Private funds	141	167	143	183	201	29,534	25,706	26,295	29,592	31,951	26	30	36	35	34	4,510	3,724	3,855	4,608	4,725	19%	15%
Total (Others)	**348**	**378**	**378**	**410**	**426**	**30,291**	**26,474**	**27,229**	**30,507**	**32,809**	**227**	**239**	**247**	**243**	**257**	**5,107**	**4,346**	**4,455**	**5,196**	**5,324**	63%	17%
Malaysian share in all foreign students	**1%**	**1%**	**1%**	**1%**	**1%**						**4%**	**5%**	**6%**	**5%**	**5%**							

Abstract (in Japanese)

要約

グローバル化と知識経済が広まるにつれ、高度なスキルを備える人材ニーズは益々高まっており、発展途上国では高度人材育成に向け、クロス・ボーダー高等教育にも取り組んでいる。本論文では、高等教育基金借款フェーズ１と２(通称 HELP1、HELP2)の支援を受けたマレーシア人留学生のデータを主に用いて、公費によるクロス・ボーダー高等教育プログラムが、過去 10 年間におけるマレーシア経済や高等教育制度のダイナミックな変化に関わらず期待された目的（卒業後の雇用に関し）を達成してきたのか考察する。分析結果によると、同プログラム卒業生の大半は、想定された産業セクターに就職するか、進学しており、マレーシア開発政策の期待と一致している。一方、卒業生のうち卒業後日本で就職するものは増加傾向にあるが、この事象は、ホスト国である日本の外国人学生を対象とした移民政策の変更の影響を受けている可能性が考えられる。

JICA Research Institute

Working Papers from the same research project

“Analysis of Cross-Border Higher Education for Regional Integration and Labor Market in East Asia”

JICA-RI Working Paper No. 26

Cross-Border Higher Education for Regional Integration:

Analysis of the JICA-RI Survey on Leading Universities in East Asia

Kazuo Kuroda, Takako Yuki, and Kyuwon Kang