JICA Research Institute

JICA-RI Working Paper

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

The Labor Market Outcomes of Two Forms of Cross-Border Higher Education Degree Programs between Malaysia and Japan

Yoshiko Koda and Takako Yuki

No. 41

March 2012

JICA Research Institute

JICA Research Institute

Use and dissemination of this working paper is encouraged; however, the JICA Research Institute requests due acknowledgement and a copy of any publication for which this working paper has provided input. The views expressed in this paper are those of the author(s) and do not necessarily represent the official positions of either the JICA Research Institute or JICA.

JICA Research Institute
10-5 Ichigaya Honmura-cho
Shinjuku-ku
Tokyo 162-8433, JAPAN
TEL: +81-3-3269-3374
FAX: +81-3-3269-2054

Copyright ©2012 Japan International Cooperation Agency Research Institute
All rights reserved.

The Labor Market Outcomes of Two Forms of Cross-Border Higher Education Degree Programs between Malaysia and Japan

Yoshiko Koda* and Takako Yuki†

Abstract

This paper examines the labor market outcomes of two different forms of cross-border higher education degree programs (i.e., full study abroad vs. twinning) between Malaysia and Japan. Specifically, based on a new graduate survey, it examines whether there are differences in the labor market outcomes between the two programs and what other factors have significant effects on the labor market outcomes. The results of regression analysis indicate that there are no significant differences between the two programs in terms of employment immediately after graduation, being in graduate-level positions in current jobs, and in the levels of earnings in current jobs. Instead, among the variables related to education, the degree fields, internship experiences, and university rankings are significant for the first employment. For current work, the results suggest that the post-graduation qualifications such as junior engineers and English and Japanese language skills become important. Based on our findings, considering the labor market outcomes as a purpose of studying abroad, twinning program between two countries could be one of the tools of human capital development.

Keywords: cross-border higher education, twinning, study abroad, employment probability, graduate-level jobs, earnings, quality of higher education institutions

* Visiting Education Specialist, JICA-RI
† Research Fellow, JICA-RI (Yuki.Takako@jica.go.jp)

This paper has been prepared as a part of a research project of the Japanese International Cooperation Agency Research Institute (JICA-RI) entitled "Cross-Border Higher Education for Regional Integration and Labor Markets," co-led by Kazuo Kuroda and Takako Yuki. Other core members of this research team include Kazuhiro Yoshida who provided valuable advice and comments, and Nozomi Sakata, Rie Tomita, and Yeeyoung Hong who provided valuable research assistance. We also received various forms of advice and support from JICA staff in Malaysia and Tokyo. We are especially grateful for the extensive advice and comments from Dr. Professor Morshidi Sirat. We are also very grateful for the valuable advice and information/data received from the Economic Planning Unit, Ministry of Higher Education, Public Service Department, Yayasan Pelajaran MARA, University of Malaya, Universiti Industri Selangor, Malaysian Qualification Agency, the Ministry of Education, the Board of Engineers Malaysia, Japan Alumni Yayasan Pelanjaran Mara, Alumni Look East Policy Society and Embassy of Japan in Malaysia.

The views expressed in this paper are those of the authors and do not represent the official position of either JICA or JICA-RI.

1. Introduction

In recent decades cross-border higher education has become a means to build capability at an individual level because it can expose students to a large variety of educational opportunities that are domestically unavailable. Developing countries with limited domestic higher education institutions can respond to their growing domestic demands for higher education through some form of cross-border higher education (OECD and World Bank 2007). According to Knight (2008), the concept of international higher education has shifted from "activities" (e.g., international cooperation, study abroad, and international agreements) in the 1980s to "mobility" of students, programs, providers, curriculum, and so forth in the mid1990s. Among the various forms of cross-border higher education degree programs, conventional study abroad, which requires overseas residence for the entire duration of the studies, could be ideal for developing a "well-trained international workforce" (Vincent-Lancrin 2007, 73). On the other hand, newer forms of cross-border higher education (e.g., twinning, double degree, and branch campuses) could be preferable forms in order to use limited resources to expand access to higher education to more students because these newer forms of cross-border education are presumably less expensive than conventional study abroad.

Cross-border higher education has been one of the long-standing foci of Japanese official development assistance (ODA) in education with various modalities of grants and concessional loans. Japan's Education Cooperation Policy 2011-2015 emphasizes the development of a cross-border network of higher education for the knowledge-based society, and it plans to promote the creation of regional networks, the acceptance of international students, and student and faculty exchanges between universities to foster highly specialized human resources (MOFA 2010). While conventional study abroad programs account for the majority of such assistance so far, there are several cases that support newer forms such as

twinning and double-degree programs. The Higher Education Loan Project (HELP), with a concessional loan and grant for Malaysia, is one of them.

The Malaysian government has been highly committed to human resource development as one of the pillars of their national development plans and has facilitated conventional as well as newer forms of cross border higher education, including twinning programs (EPU 2006; Morshidi 2006; Lewis and Pratt 1996). Since the early 1980s, under the Look East Policy commenced by the Prime Minister Mahathir, the Malaysian government has supported study abroad programs for Malaysian youth in Japan. The Japanese government has provided its assistance and cooperation to support the Malaysian government's efforts. HELP has supported the cross-border higher education in engineering in two different forms, the conventional study abroad in phase one (HELP 1) and twinning arrangements beginning in phase two (HELP2 and HELP3). The latter emerged to address cost-saving concerns by reducing the residential requirement in Japan from four years to three years for students receiving undergraduate degrees from Japanese universities. Meanwhile, both governments have continued their support of the conventional form under the Look East Policy Program (LEPP), which has a four-year residential requirement in Japan. While this program has been conducted since the early 1980s, it was financed by a Japanese concessional loan only for the period of recovery from the 1997 Asian economic crisis. Two different government agencies execute these programs. HELP is run by the Yayasan Pelajaran MARA (YPM) or the MARA Education Foundation under the MARA Foundation. LEPP is run by the Public Service Department (JPA or PSD) which oversees various types of scholarships programs.[1]

1. Established in 1963 under the YPM Act, YPM supports educational activities of Malaysia's main ethnic group called Bumiputra (JBIC 2001). The JPA scholarship for Japan program also has supported Bumiputra.

Whether these two forms of cross-border higher education programs yield the same labor market outcomes is an important policy question. As discussed later, this is because the twinning arrangement could reduce cost of education without sacrificing the quality of human resources. Focusing on two different forms of the programs, namely HELP 2 and the LEPP loan, this paper analyzes and compares the effectiveness of newer and conventional forms of cross-border higher education degree programs with respect to labor market outcomes. Although the newer forms of cross-border higher education have also been supported by other bilateral and multilateral donors, to our knowledge, there is very limited research available to empirically evaluate the labor market outcomes of such programs. The remainder of this paper consists of the following four sections: research framework and data; results; discussion; and policy implications.

2. Research framework

2.1 Findings of earlier studies

According to Knight's definition of cross-border higher education, mentioned above, conventional study abroad is about the mobility of people. Thus, the students move to a host country (Knight 2008; OECD and World Bank 2007). In the newer forms of cross-border higher education (e.g., twinning arrangements, joint degrees, double degrees, franchises, and branch campuses), a program or a provider moves to the students.

While both developing and OECD countries have been engaged in cross-border higher education activities, each country's and each actor's motives to do so vary depending on each country's unique needs. Vincent-Lancrin (2007) points out that countries often engage in cross-border higher education to build capacity, particularly developing countries where there is an unmet demand for human resources and capacity needs for higher education institutions. One

of the benefits of the new forms of cross-border higher education to individuals and to the governments that support students is cost-savings as compared to traditional study abroad programs.

Given that the newer forms of cross-border higher education have emerged relatively recently, the existing literature points out that little empirical study exists on the roles of cross-border higher education, for example, in human resource development (Knight 2006; OECD and World Bank 2007; Pyvis and Chapman 2007; McKenzie et al. 2008). Furthermore, as Wiers-Jenssen and Try (2005) point out, the theoretical and empirical literature on the transition from higher education to work with a focus on cross-border higher education is scarce.

A relatively small number of empirical studies on labor market outcomes examine the level of earnings, probability of employment, and issues of over-education with cross-border higher education (Ball and Chik 2001; Chik 1997; Lewis and Pratt 1996; Lewis and Shea 1994; Wiers-Jenssen and Try 2005). For example, motivated by the question of whether the government should spend its budget on scholarships for overseas study, Ball and Chik (2001) compare the levels of income for foreign-trained (i.e., UK and US) versus locally trained university graduates in Malaysia and found no statistical differences between these two forms of programs (also Chik 1997). Instead, their findings indicate that factors such as gender, duration of employment, self-esteem, ownership of employers (i.e., domestic or foreign), academic major, and English language skills were relevant to the level of income.

In terms of the labor market outcomes of higher education graduates in general, Machine (2007) points out that while many studies concentrate on the wage premium of higher education graduates, others measure labor market outcomes by the probability of being employed. For example, an earlier work by Rumberger (1993) examines three types of

qualitative sources (i.e., the subject of studies, the quality of the higher education institutions, and the graduates' undergraduate performance) that influence the incomes of recent college graduates in the US (i.e., students that received either an undergraduate or a master's degrees between 1985 and 1986). The three sources are based on the preceding studies, and the findings of the paper confirm that these three sources are important for earnings. More specifically, the subject of studies has significant effects on initial earnings. For example, controlling for all other variables, graduates in engineering and health received one-third higher starting salaries than those majored in the humanities. The undergraduate performance as measured by grade point average (GPA) is also an important predictor for the overall sample, for females, and for graduates with business, health, science, or mathematics degrees. The quality of the higher education institutions is measured by two variables, public institutions and Astin's selectivity score (SAT), and it is also significant for the relative salaries.

More recently, some of the existing studies explored different ways to measure the quality of higher education institutions, which reflect labor market outcomes. These studies examined the first destination (i.e., employment or further studies) and the job categories (i.e., graduate-level and non-graduate level jobs) of domestic higher education graduates (Bratti et al. 2004; Mason et al. 2009; McGuiness 2003; Smith et al. 2000).[2] For instance, Smith et al. (2000) examined the first destinations of the 1993 cohorts in the UK in terms of the probabilities of (1) being employed or in further studies six months after graduation and (2) being in a graduate-level job. Similar effects to the above literature on earnings are observed: the subject of studies, the degree class, the social class, and pre-university qualifications all have significant effects on the dependent variables. While the subject of study has a positive effect on employment, the engineering field has no significant effects on further studies or on being in

2. Some of them explore the labor market outcomes of higher education graduates with the intention of ascertaining a higher education performance indicators--more specifically "employment-based university performance indicators" (Smith et al. 2000).

graduate-level jobs, and it has a significant negative effect for females. Concerned with higher education graduates' employability, Mason et al. (2009) examined the probability of being employed and being in a graduate-level job for UK graduates after completing their degrees. Their findings indicate that degree class, structured work experience (i.e., sandwich training placement), and employer's involvement in course design have significant effects on the graduates' employment within six months of graduation and on being in a graduate-level jobs.

Much of the existing literature examines earnings and employment probability as separate topics. However, Wiers-Jenssen and Try (2005) compare the labor market outcomes of Norwegian graduates who received domestic college degrees with those who received foreign degrees and diplomas across three dimensions of labor market outcomes: job probability, skill mismatch, and wages of the graduates. The study is based on a graduate survey of Norwegian graduates 3.5 to 5 years after graduation. The authors found positive results for those who studied abroad in terms of higher wages, but negative results for their employment probability and a higher likelihood of their being over-educated. Furthermore, the probability of employment for those who study abroad (in any form) for more than two years is lower than that for those who study in domestic institutions for the entire time. However, the probability of employment is higher for those who study abroad for less than two years than it is for the domestic graduates, and this difference is significant. Also, the paper found that the prestige of the foreign higher education institutions, as assessed by the graduates, had no effects on their employment probability.

2.2 Research questions

Two questions are explored in this paper. The first question explores whether there are any major differences between the two forms of cross-border higher education degree programs, that is, the LEPP and HELP2, in terms of the three dimensions of labor market outcomes. These three dimensions include the employment probability in the first job, the job categories, and the earnings in their current jobs. Some of the existing studies indicate that the graduates of the Australian twinning programs with Malaysia and other Asian countries yield similar labor market outcomes when compared with other forms of cross-border higher education (Lewis and Pratt 1996; Bennington and Xu 2001). Pyvis and Chapman (2007) also report that the predominant motivation of Malaysian students for studying at the Australian university's offshore campus in Malaysia is the improvement in their employment prospects after graduation. Those findings, coupled with the expansion of new forms of cross-border higher education in Malaysia, indicate that newer forms of cross-border higher education are popular. These findings also provide grounds to assume that there are no differences in the different forms of cross-border higher education between Malaysia and Japan. If the new form of cross-border higher education (i.e., HELP2) has yielded similar labor market outcomes to traditional study abroad programs (i.e., LEPP), then HELP2 could be a good alternative because it is expected to require less cost and time than LEPP to obtain an undergraduate degree. Rather than the different forms of cross-border higher education, this paper assumes that other educational factors identified in the earlier works have significant effects on the labor market outcomes. Thus, the second question is whether other educational factors at the departmental and the institutional levels have significant effects on the labor market outcomes. In addition to the academic factors, this paper also examines factors related to post-graduation qualifications and current work experiences.

2.3 Data

The JICA Research Institute conducted the graduate survey of the HELP1, HELP2, and LEPP programs with the collaboration of the two executing agencies for these programs. Yayasan Pelajaran MARA (YPM) under the MARA Foundation kindly provided the student lists for the HELP1 and HELP2 programs and the Public Service Department (JPA), which is the government agency in charge of the government scholarships for study abroad, provided the LEPP student list. The survey covers all identifiable HELP1 & 2 graduates and LEPP graduates who completed the program between 2004 and 2009 (2009 is HELP2 only). The survey questions consist of four parts: (1) the graduate's background information, (2) their work history and other work-related questions, (3) their educational history and other education-related questions, and (4) their graduate perceptions of studying in Japan.

The survey was sent out via email in early 2010. Out of 1,315 graduates who were included on the graduate lists of YPM or JPA for the years of our research interest (i.e., the expected graduation year from 2004 to 2008), 73% of the graduates (960 graduates) had contact information on the lists. The request for participation in the survey was sent to those graduates by email, followed by phone calls and traditional mail. From the total number of graduates 38% (504 graduates) responded to the survey. Due to the unavailability of the contact information or withdrawal from the program, 27% of the observations on the lists were dropped. Further, one respondent's response was removed due to invalid answers. The response rate for the survey was 53%. However, in the subsequent analysis, we dropped the HELP1 graduates and two outliers. Of the 358 respondents from HELP2 and LEPP, the following analysis used 356 respondents. The HELP1 graduates are omitted because they entered the labor market earlier than the HELP2 and LEPP graduates. HELP2 and LEPP graduates entered the labor market between 2004 and 2009. For the details of the survey population, see Annex 1.

The graduates surveyed in this research are homogeneous in the following areas: (1) The graduates of HELP2 and LEPP were sponsored by the Malaysian government scholarship programs offered by the above-mentioned agencies, YPM and JPA. Both agencies require the applicants for the programs to complete secondary education and score high marks in the matriculation exam called the Sijil Pelajaran Malaysia-SPM (or the Malaysian Certificate of Education) and the selection process requires interviews of candidates;[3] thus, there is a built-in mechanism for ability control through comparable selection criteria and a mechanism for admission into the program after their secondary education; (2) The graduates are predominantly Bumiputra, the main ethnic group; (3) The graduates are mostly in engineering fields, although they studied at different public and private higher education institutions in Japan. Nevertheless, there is one difference between the two programs—the duration of study in Malaysia. HELP2 includes (1) a two-year local program, including a pre-university education, Japanese language course, and the first year of undergraduate study, and (2) three years of undergraduate study at a Japanese university. On the other hand, LEPP requires a total of six years, i.e., (1) two years of pre-university education and Japanese language classes, and (2) four years of undergraduate study at a Japanese university.[4] Thus, HELP2 requires one year less in Japan than LEPP (See Table 1 for details of the programs' characteristics and Figure 1 for the structure of the Malaysian education system). While we cannot avoid the selection bias, the fact that this group is relatively homogeneous aside from the forms of cross-border education provides us with a unique opportunity to test our hypothesis.

3. SPM has changed its system over time and so are the minimum requirements of the two programs. SPM has 9 grade levels, 1A through 9G in the system used since 2000 and before 2009. Prior to 2009, there were no restrictions on the number of subjects that students could sit for the examinations. During the interviews of the YPM and JPA officials, we were told that in principle the YPM candidates are expected to have the top three grade levels (i.e., 1A, 2A, and 3B) and LEPP applicants to have at least LEPP eight As (the YPM interview was held on January 11, 2010 and the JPA interview was on November 6, 2009). Among the HELP2 and LEPP respondents who reported their SPM's four science subject scores in our survey, on average all HELP2 respondents and 90% of LEPP respondents scored the top three grade levels in four science-related subjects (i.e., modern math, additional math, chemistry, and physics). However, among the respondents who took English (Cambridge examination), only 49% of HELP2 and 42% of LEPP respondents scored the top 3 level.

4. In the first year of the LEPP program various subjects for the pre-university education for the engineering department of University of Malaya are taught in Malay as well as Japanese language. In the second year other subjects are also taught in Japanese (FASID 2007).

Table 1. Two Japanese ODA-loan funded CBHE projects between Malaysia and Japan

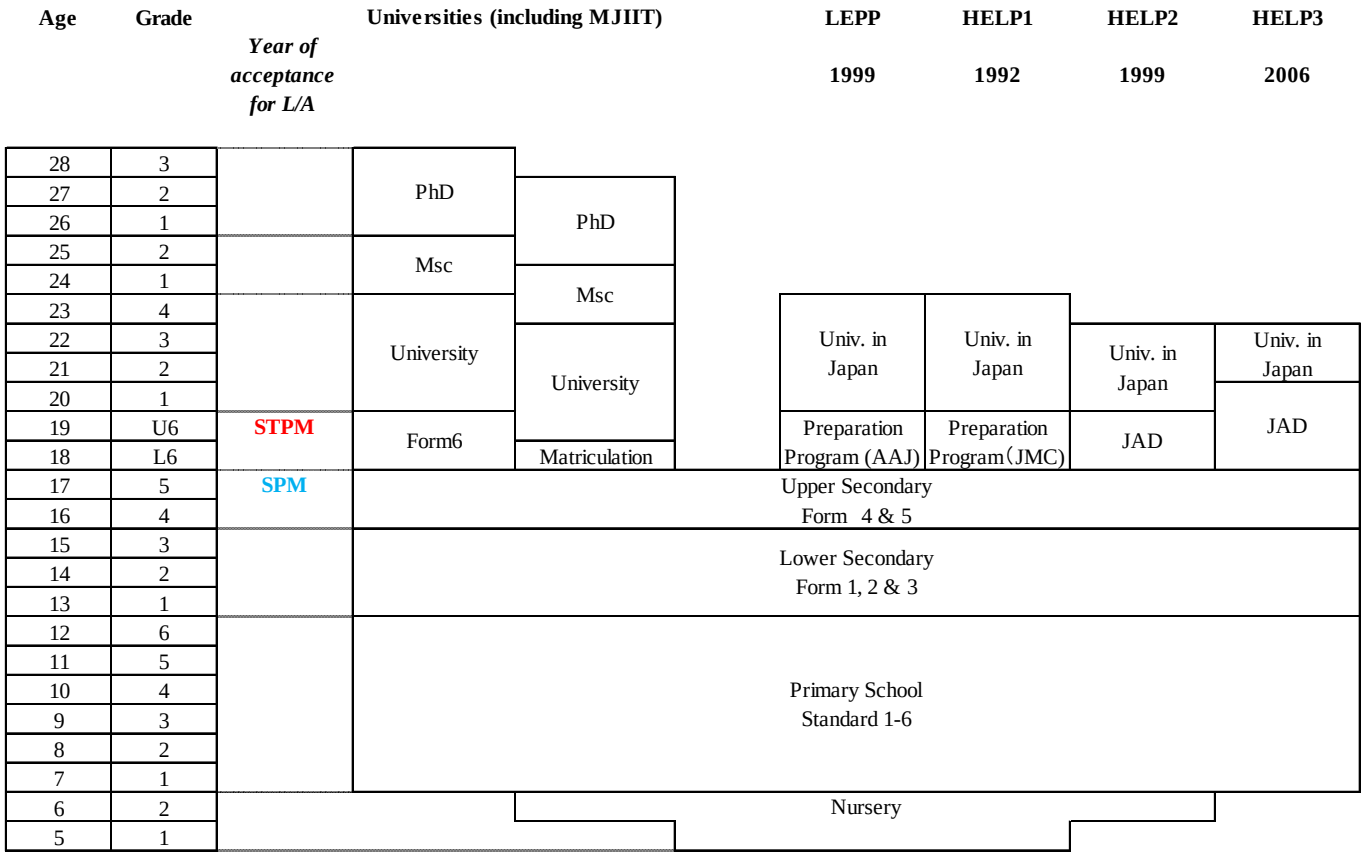
	HELP 2	LEPP
Project information:		
Implementation period	1999-2009	1999-2008
Implementation agency	YPM	JPA
Program design for bachelor degree:		
Entry requirement	Top level (SPM)	Top level (SPM)
Duration	2 (Malaysia) + 3 (Japan) Total: 5 years	2 (Malaysia) + 4 (Japan) Total: 6 years
Program in Malaysia	Japanese & preparative subjects plus equivalent to 1st year of UG	Japanese & preparative subjects
Institution in Malaysia	JMC/Bangi collage (affiliated to YPM)	UM or IBT
Form of cross-border higher education	Twinning (transfer at 2nd year)	Conventional (entry at the 1st year)
Entrance to university in Japan	Performance of program in Malaysia, transfer examination results or interviews in Japan	MEXT-test (replaced with EJU since 2008)
Years of entry or transfer to university in Japan	2001 for 1st group- 2005 for 5th group	1999 for 1st group- 2004 for 6th group
Expected year of graduation	2004 - 2008	2003 – 2008 [a]
Number of the enrolled in Japanese universities (total)	280	885
Number of universities	40 (Pub27, Pri13)	
Subject areas	Engineering (several fields)	Mainly engineering
Postgraduate scholarships as another component of the project	Master	Master and PhD

Source: JICA internal data

Note: [a] We limited the sample to those who graduated between 2004 and 2008 (excluding a few dropouts).

EJU: Examination for Japanese University Admission for International Students; HELP: Higher Education Loan Fund Project; IBT: Institut Bahasa Teikyo; JMC: Japanese Matriculation Centre; JPA:Jabatan Perkhidmatan Awam; LEPP: Look East Policy Program; MEXT: Ministry of Education, Culture, Sports, Science & Technology in Japan; ODA: Official Development Assistance; SPM: Sijil Pelajaran Malaysia (Malaysian Certificate of Education); UG: Undergraduate; UM: University of Malaysia; YPM: Yayasan Pelajaran MARA (Mara education foundation).

Figure 1. Malaysian higher education system and Japanese ODA loan projects.



Note: AAJ: Ambang Asuhan Jepun; JAD: Japanese Associate Degree Program; JMC: Japanese Matriculation Centre; MJIIT: Malaysia Japan Insternational Institute of Technology; SPM: Sijil Pelajaran Malaysia (Malaysian Certificate of Education); STPM: Sijil Tinggi Persekolahan Malaysia (Malaysian Higher School Certificate); L/A: Loan Agreement.

2.4 Modeling

Using the graduate surveys, logistic regression for the binary dependent variables (i.e., first employment and current positions) and OLS for the continuous dependent variable (i.e., current monthly salary) are used for the following analysis.

To assess the labor market outcomes of HELP 2 and LEPP, the following three dependent variables are examined: (1) the employment probability for the first job, (2) graduate-level (non-entry level) positions in the current job, and (3) earnings of the current job. More specifically, the paper first examines the probability of employment immediately after graduation. Originally, we considered six months after graduation to follow the benchmark used in the previously mentioned literature. However, approximately 90% of graduates were either working within six months or pursuing further studies; thus, there was not enough variability among the graduates. Nevertheless, how soon the graduates start working, whether differences exist between HELP2 and LEPP, and what other factors influence early employment may be important policy questions, help the government and higher education institutions plan, and monitor cross-border higher education degree programs in the future. Therefore, we shortened the number of months before employment to one month after graduation. In reality, most graduates start job searches prior to the graduation date because most Japanese universities complete their academic courses one to two months prior to graduation.

Second, the probability of being in a graduate-level position in the current jobs is explored.[5] The definition of a graduate level job varies among the literature that examines the occupations of undergraduate degree holders. For instance, Smith et al. (2000) used the standard occupational classification to categorize the self-reported occupation and then categorized them

5. We also tried to analyze the first jobs, but the limited number of responses to this question caused an estimation problem; this question was therefore dropped.

as graduate or non-graduate jobs based on the criterion of whether they are typically considered as graduate or non-graduate jobs. In this paper, the occupational categories of the Federation of Malaysian Manufacturers (FMM) and the Malaysian Employers Federation (MEF) are used as the points of reference (Table 2).[6] These organizations divide occupational categories into two large categories: (1) executive positions, including management positions, professionals such as engineers, and "executives," which are entry-level jobs for undergraduate degree holders in this category and (2) non-executive positions. In this paper, the category of executive positions is divided into two categories, graduate-level positions and entry-level positions. The entry-level positions for the executive category are grouped together with the non-graduate level positions (i.e., the entry-level/non-executive level position). In other words, the former includes all positions in the large category of the executive positions in the FMM and MEF occupational categories, except for the "executives," and the latter includes the "executives," non-executive positions, and other positions where the corresponding monthly salary is below the mean salary of the graduate-level positions. The rationale behind this modification of the occupational categories is as follows. Because 95% of the HELP2 and LEPP graduates who reported their current occupation hold positions in the executive positions as defined by the FMM and MEF, adopting their occupational categories would not yield meaningful results. By grouping the "executives" with non-graduate level positions, it would allow us to see what factors influence the graduates that are in a higher graduate-level position. Defining "executives" as an entry-level position is based on the expectation of the LEPP program, which expects the graduates to hold at least an entry-level position upon graduation. In addition to the above two dependent variables, the paper examines the level of current monthly salaries (log transformed).

6. The data were provided by the Economic Planning Unit (EPU) of the Malaysian Government.

Table 2. Graduate-level positions and occupations by source

This paper	Federation of Malaysian Manufacturers (FMM)	Malaysian Employers Federation (MEF)
1. Graduate-level jobs (non-entry level)	**1. Executives**	**1. Executives**
1) Manager	Top management Division/department director/head Senior managers Managers	Top executives Senior managers Managers
2) Assistant manager	Assistant managers	Assistant managers
3) Senior engineer	Senior engineers	
4) Engineer	Engineers	Engineers
5) Senior executive	Senior executives	Senior executives
6) Other professionals		
2. Entry level/non-graduate level jobs		
7) Executives[a]	Executives[a]	Executives[a]
8) Non-executives	**2. Non-executives**	**2. Non-executives**
9) Others (those with the monthly salary is lower than the average of non-entry graduate-level salaries)		

Note: [a] In Malaysia, the entry level position for the executive jobs is called "Executives" and included in the category of the executives in the FMM and MEF. In this paper, the categories are divided into "Graduate-level jobs (excluding the executives)" and "the entry-level/non-graduate-level jobs" and the executives are included in the entry-level /non-graduate level jobs.

Based on the findings of the existing literature, this paper examines four categories of independent variables (1) individual background (i.e., gender, years since graduation, and pre-university aptitude test scores), (2) program and departmental level (i.e., program dummy of HELP2 and LEPP, degree fields, internship experiences), (3) higher education institution level (i.e., university rankings), and (4) post-graduation qualifications and employment (i.e., further studies, junior professional engineering qualification, English proficiency/Japanese proficiency, change of jobs after the first job). The same variables used for the first three categories are used for all dependent variables, with a few additional variables to capture the current positions and earnings. In the current positions and earnings, the fourth category, post-graduation qualifications and employment-related variables, is added to the specifications. Furthermore, interaction terms between the program dummy (1=HELP2 and 0=LEPP) and significant independent variables are added to determine their effects (see Table 3 for the summary statistics).

Table 3. Summary of variables

Variable	Obs	Mean	Std. Dev.	Min	Max	Description
Dependent variables						
FSTEMP1MD	296	0.72	0.45	0.00	1.00	First employment within one month of graudation (those whose first activity is working only): 1=employed, 0=not employed
jcatcD2	278	0.80	0.40	0.00	1.00	Graduate-level positions in current job (those who are currently working and reported the current position only): 1=graduate-level position, 0=entry-level executive/non-graduate level position
slcmln	205	8.04	0.22	7.31	8.85	Log current monthly earnings in RM
jcatengD	278	0.74	0.44	0.00	1.00	Alternative for jcatcD2. Graduate-level positions at the targeted employers of HELP2 and LEPP programs: 1=graduate-level position, 0=entry-level executive/non-graduate level position
Individual background						
male	356	0.69	0.47	0.00	1.00	Gender: male=1, female=0
yrsgrd_10	356	3.77	1.45	1.00	6.00	No. of years since graduation
spmave	343	7.81	0.84	2.00	9.00	pre-university aptitude test (average)
Program/department						
h2_1	356	0.46	0.50	0.00	1.00	Program dummy: HELP2=1, LEP=0
ugfldC3	352	2.03	0.79	1.00	3.00	Degree fields: 1=E/E, 2=mechanical, 3=other engineering fields and computer science
ugfldC3_1	352	0.30	0.46	0.00	1.00	Degree fields: 1=E/E, 0=others
ugfldC3_2	352	0.37	0.48	0.00	1.00	Degree fields: 1=mechanical engineering, 0=others
ugfldC3_3	352	0.33	0.47	0.00	1.00	Reference group (other engineering and computer science)
h2Xugf_1_1	352	0.15	0.36	0.00	1.00	Interaction term: HELP2 and degree field (E/E)
h2Xugf_1_2	352	0.16	0.36	0.00	1.00	Interaction term: HELP2 and degree field (mechanical engineering)
intn_1	329	0.28	0.45	0.00	1.00	Internships: 1=yes, 0=no
Institution						
rkqs10D_1	356	0.46	0.50	0.00	1.00	University rankings (QS): 1=listed, 0=not listed
h2Xrkq_1_1	356	0.22	0.42	0.00	1.00	Interaction term: HELP2 and universities listed in QS
Post graduation qualification and experiences						
FSTSTU_1	356	0.15	0.36	0.00	1.00	Further study after undergraduate degrees:1=yes, 0=no
d1a3_1	344	0.14	0.35	0.00	1.00	Registration for the Graduate Engineer at BEM:1=yes, 0=no
langeng	343	4.09	0.69	1.50	5.00	Average of self-assessment of English language proficiency (written and oral): 1-5
langjpn	343	3.91	0.73	1.00	5.00	Average of self-assessment of Japanese language proficiency (written and oral): 1-5
jobchange_1	356	0.46	0.50	0.00	1.00	Change of jobs after the first job (1=changed, 0=all others, including unknown)
h2Xjob_1_1	356	0.19	0.39	0.00	1.00	Interaction term: HELP2 and job change

In addition to the above graduate survey, this paper also uses the World Ranking: 2010 QS Asian University Rankings (engineering and information science) for the quality measurements of the higher education institutions.[7] Given the ongoing debate regarding the adequacy of various global and domestic university rankings in measuring the quality of higher education institutions, we are aware that these may be controversial indicators and may not measure the quality of higher education institutions properly (Marginson 2007; Bratti et al.

7. Downloaded from http://www.topuniversities.com/university-rankings/asian-university-rankings in Jan. 2011

2004; Smith et al. 2000).[8] However, in the absence of other alternatives, this paper uses the QS ranking because (1) it has incorporated the views of business communities and focuses on Asian universities and (2) the list covers more institutions of interest to us.

3. Results

3.1 Descriptive statistics

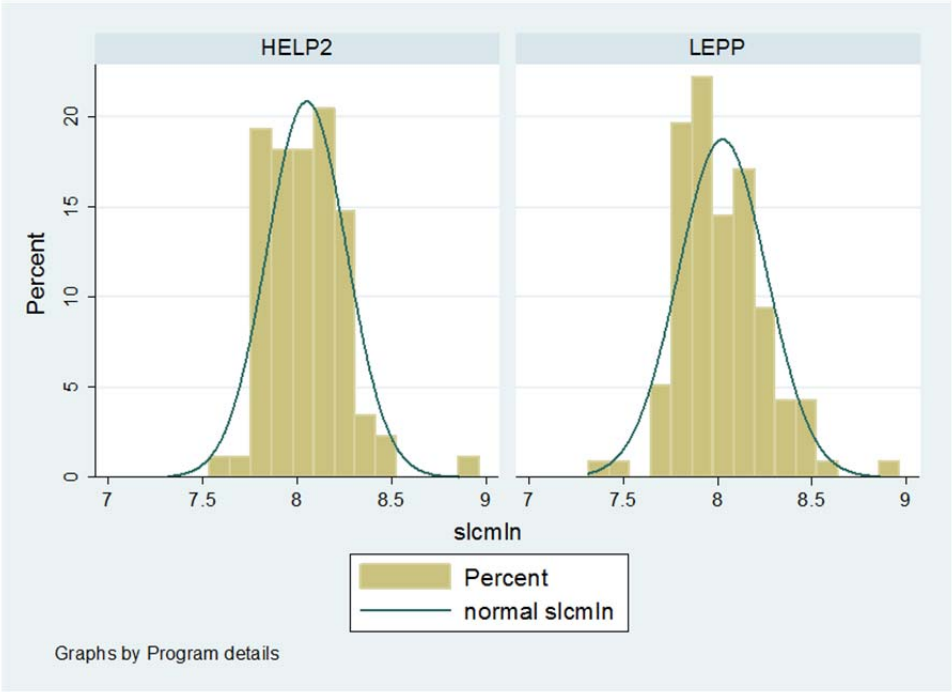
Of the 356 respondents of HELP2 and LEPP, 83% chose to work after graduation, and 15% proceeded on to further studies. When compared with LEPP, more HELP2 graduates (22%) pursued further studies than LEPP graduates (10%), and more LEPP graduates (89%) chose to work after graduation than HELP2 graduates (77%). The difference in the first employment is significant. This difference likely reflects that built-in scholarships for graduate degrees are available for HELP graduates in the HELP2 program. JPA does sponsor post-graduate studies, but the selection is not limited to LEPP graduates. Among the HELP2 graduates who pursued further studies or earned advanced degrees after completing their undergraduate degrees, 53% received funding from the MARA foundation. Among the LEPP graduates who pursued further studies only 18% received funding from JPA.

Among the 296 who worked after graduation, the majority of HELP2 and LEPP graduates were employed within six months of graduation (90%), while 10% of the graduates waited longer than six months. There was no difference observed in terms of the six month benchmark between HELP2 and LEPP graduates. Within one month of graduation, 72% of the 296 respondents were employed, and the remaining 28% found employment after the first month. Again the distributions of HELP2 and LEPP graduates are similar for these items.

8. Some of the above literature explore the labor market outcomes of higher education graduates to ascertain the potential higher education performance indicators--more specifically “employment-based university performance indicators” (Smith et al. 2000).

Of the 356 respondents, 83% are currently working, while 17% are either engaged in other activities—the majority pursuing further studies—or provided no information on current activities. In regards to the current positions, out of the 278 respondents who responded to the question on the current positions, 80% hold graduate-level positions (i.e., non-entry level), while 20% hold entry-level or non-graduate positions. However, 25% of the respondents graduated in 2008/2009, and many of them landed entry-level jobs. Thus, 29% of the entry-level/non-graduate job holders are recent graduates from 2008/2009. While the position of the graduates is one indicator of successful labor market outcomes, the level of earnings is another dimension for gauging the labor market outcomes of higher education graduates. In terms of the current monthly salary, 69% of those currently working reported their monthly salaries in Malaysian Ringgit. The mean salary is 3,172 Malaysian Ringgit (3,205RM for HELP2 and 3,146RM for LEPP). Figure 2 shows the distribution of the current earnings. Again, there is no significant difference between the mean salary of HELP2 and LEPP graduates.

Figure 2. Log current monthly salary in RM by program



Source: JICA graduate survey 2011.

3.2 Estimation results and discussion

In this section, the regression results of the three dimensions of the labor market outcomes are discussed separately. In the discussion section, the paper further explores the differences and similarities of the three dimensions of labor market outcomes.

3.2.1. First activity after graduation

First, we explore the probability of being employed within one month of graduation and its predictor variables. Table 4 includes the four specifications of the logistic regression. The first column (1) is the base specification with all the independent variables, including the program dummy. Three interaction terms are added in the second (2) through the fourth columns (4). These interaction terms are the degree fields, internships and the university rankings with the program dummy (i.e., HELP2=1 and LEPP=0). The likelihood-ratio tests indicate that there are no differences in the estimations of the base model (Table 4, column 1) and the other models (Table 4, columns 2 through 4).

Table 4. First employment within the first month of graduation (in odds ratio)

	(1)	(2)	(3)	(4)
male	2.435**	2.382**	2.455**	2.444**
	(0.008)	(0.010)	(0.007)	(0.008)
yrsgrd_10	1.090	1.074	1.087	1.092
	(0.426)	(0.516)	(0.440)	(0.417)
spmave	1.140	1.140	1.140	1.144
	(0.468)	(0.474)	(0.469)	(0.459)
h2_1	1.151	1.639	1.206	1.086
	(0.682)	(0.362)	(0.612)	(0.846)
ugfldC3_1	2.718**	3.619*	2.716**	2.696**
	(0.009)	(0.017)	(0.009)	(0.009)
ugfldC3_2	2.569*	3.194*	2.547*	2.536*
	(0.012)	(0.017)	(0.013)	(0.014)
intn_1	1.854+	1.872+	1.993	1.844+
	(0.094)	(0.094)	(0.106)	(0.098)
rkqs10D_1	2.371**	2.435**	2.390**	2.227+
	(0.008)	(0.006)	(0.007)	(0.059)
h2Xugf_1_1		0.549		
		(0.432)		
h2Xugf_1_2		0.609		
		(0.500)		
intXh2_1_1			0.752	
			(0.731)	
h2Xrkq_1_1				1.155
				(0.821)
_cons	0.117	0.106	0.115	0.117
	(0.168)	(0.154)	(0.165)	(0.168)
N	260	260	260	260
chi2	30.68	31.42	30.80	30.74
p	0.000160	0.000500	0.000320	0.000329

Source: JICA graduate survey 2011.
Note: P-values in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

The results indicate that there is no significant difference between HELP2 and LEPP in terms of the main effect of the program on the early employment of the graduates. Adding the three interaction terms of the program dummy and three independent variables that have significant effect on the early employment of the graduates also indicate there is no significant difference between the two programs. Instead, the degree fields and internship experience (the degree level variables) as well as the university rankings (used as an indicator of the quality of the higher education institution) have positive and significant effects on being employed within the first months of graduation.

For the degree fields, we categorized various engineering fields into three major categories: (1) electrical and electronics engineering related subjects, (2) mechanical engineering related subjects, and (3) other engineering and computer science related fields (the reference categories). In all specifications in Table 4, the results indicate that both electrical and electronics-related fields and mechanical engineering-related fields have positive and significant effects on very early employment. When all other variables are held constant, the odds of being employed within one month of graduation increase by a factor of 2.7 for electrical and electronics engineering degree holders and by 2.6 for mechanical engineering degree holders as compared with those with other engineering and computer science degrees (column 1). To put this in a different way, for instance, when all other binary variables are kept at zero and continuous variables are kept at their mean, the probability of being employed within the first month of graduation with other engineering and computer science degrees is 31% while the probability is 55% if the graduates hold electrical and electronics engineering degrees. Similarly, the probability for the mechanical engineering graduates is 54%. This finding is consistent with the findings of other studies which indicate that the subject of study has significant effects on employment (e.g., Smith et al. 2000). However, the existing literature typically examines broad subjects of studies, and the engineering field tends to be one of the subjects that has significant

effects on labor market outcomes. Our result suggests that there are variations even within the engineering field.

To see if the subject fields interact with the program dummy, we added the interaction terms of the degree fields and the program dummy in the second specification (column 2). The interaction terms of the subjects and the program dummy have no significant effects on early employment. The Wald test also indicates no differences in the estimations with or without the two interaction terms (column 2). Nevertheless, the simple effects of the electrical and electronics engineering-related degrees and the mechanical engineering-related degrees stay positive.

The findings of Mason et al. (2009) indicate that structured sandwich placement has significant effect on employment within six months of graduation. One of the characteristics of LEPP is that it incorporates an internship as a part of the program, though this internship is not compulsory for the LEPP graduates. Similar to the findings of Mason et al., an internship experience has significant and positive effects on early employment, but the level of significance is very weak. The interaction term between the program dummy and internship is negative but not significant. Furthermore, adding this interaction term changed the simple effect of internship to non-significant (column 3). Thus, our finding regarding the effect of internship on early employment is inconclusive.

The regression results indicate that attending a university listed in the 2010 World University Rankings has a positive and significant effect on early employment when compared to attending a non-listed university. In the first column (1), graduating from a listed university would improve the odds of early employment by the factor of 2.4 when compared with the non-listed institutions. In other words, the probability of being employed within a month of

graduation for a graduate from a listed university is 52% while the probability for a graduates from a non-listed university is 31% when all other binary variables are held at zero and the continuous variables are held at their mean. The interaction term between the two variables is not significant (column 4). Nevertheless, the simple effect of the university rankings stays positive and significant even after adding the interaction term in the specification.

3.2.2. Current work

To examine the current work, we examine two dimensions of labor market outcomes. First, we use a dummy variable to indicate graduate-level jobs and entry-level/non-graduate level jobs (1=graduate-level jobs and 0=entry-level/non-graduate level jobs). Second, we use current monthly earnings. In addition to the educational variables used to analyze the first employment, the base specification for the current work includes further studies, junior professional engineering qualifications, self-assessment of English language proficiency, and change of jobs since the first job (column 1 in Tables 5 to 7). In the second through the fourth columns, the interaction terms of the degree fields, the university rankings, and the change of jobs with the program dummy are added.

3.2.2.1 Current positions

Table 5 shows four specifications for the graduate-level (i.e., non-entry level) positions in the current jobs. The likelihood-ratio tests also indicate that there are no differences in the estimations of the base model (i.e., Table 5, column 1) or the other models (i.e., Table 5, columns 2 through 4).

Table 5. Graduate-level vs. entry/non-graduate level positions in current jobs (in odds ratio)

	(1)	(2)	(3)	(4)
male	3.385**	3.273**	3.374**	3.407**
	(0.002)	(0.002)	(0.002)	(0.001)
yrsgrd_10	1.245	1.261	1.243	1.238
	(0.131)	(0.116)	(0.134)	(0.139)
spmave	1.873**	1.905**	1.862**	1.844**
	(0.007)	(0.006)	(0.008)	(0.008)
h2_1	0.911	0.937	0.976	0.738
	(0.824)	(0.923)	(0.968)	(0.590)
ugfldC3_1	2.224	2.866	2.237+	2.247+
	(0.100)	(0.106)	(0.099)	(0.096)
ugfldC3_2	1.028	0.935	1.040	1.038
	(0.950)	(0.903)	(0.929)	(0.933)
intn_1	1.260	1.290	1.262	1.247
	(0.586)	(0.549)	(0.583)	(0.605)
rkqs10D_1	0.414*	0.398*	0.435+	0.420*
	(0.017)	(0.014)	(0.085)	(0.019)
FSTSTU_1	1.427	1.345	1.427	1.521
	(0.632)	(0.693)	(0.632)	(0.577)
d1a3_1	2.395	2.421	2.414	2.425
	(0.165)	(0.163)	(0.163)	(0.160)
langeng	0.932	0.938	0.930	0.931
	(0.808)	(0.823)	(0.802)	(0.804)
jobchange_1	0.314**	0.303**	0.313**	0.268**
	(0.005)	(0.004)	(0.005)	(0.009)
h2Xugf_1_1		0.597		
		(0.575)		
h2Xugf_1_2		1.321		
		(0.748)		
h2Xrkq_1_1			0.890	
			(0.874)	
h2Xjob_1_1				1.507
				(0.575)
_cons	0.0154*	0.0131*	0.0159*	0.0192+
	(0.038)	(0.033)	(0.039)	(0.051)
N	249	249	249	249
chi2	43.95	44.72	43.97	44.26
p	0.0000156	0.0000453	0.0000310	0.0000278

Source: JICA graduate survey 2011.
Note: Exponentiated coefficients; p-values in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

In terms of the differences between HELP2 and LEPP, again, no discernable differences are observed as to the graduate-level positions. In regards to the other independent variables, the results indicate that most of the variables that were significant for the first employment within the first month of graduation are no longer significant for holding a graduate-level position in the current job. One of the exceptions is the university ranking, which is still significant, but negative, for holding a graduate-level position in the current job. When the interaction term between the program dummy and the university rankings are added in the specification, the simple effect of the university ranking is still significant, but the interaction term is not (column 3).

Among the variables related to post-graduation qualifications and experiences, changing jobs after the first job is a variable that is significant across the specifications. It is significantly and negatively associated with holding a graduate-level position in the current job. This relationship could imply that a limited number of graduate-level positions are available for early careers and that those who took graduate-level positions for their first jobs tended to stay at the same jobs.

Out of the 278 respondents whose sector of their current employers are identifiable, 55% work in the manufacturing sector, 45% in the service sector, and less than 1% in agriculture. The needs of education and post-graduation experience may be diverse in not only the level of occupation, but also in the type of occupation and industry. Therefore, we created an alternative dependent variable to capture graduate-level positions not only in the manufacturing sector but also in the industries in other sectors that are particularly relevant to those with engineering background. Based on the information regarding the respective organizations' principal activities, those with graduate-level positions, and who work for targeted employers are defined as follows: (1) all graduate-level positions in the manufacturing firms, (2) senior engineers or

engineers working in non-manufacturing sectors, (3) other professionals in post-secondary education institutions which include engineering and technology-related departments, and (4) management and senior executives, as well as other professionals, in IT-related services or engineering and other manufacturing-related services.[9] As Table 6 shows, the regression results indicate that the qualification as a junior professional engineer, called the Graduate Engineer at the Board of Education, Malaysia (BEM), has a significant and positive association with being in a graduate-level positions at the target employers.[10] This association implies that this junior professional qualification is important for attaining a graduate-level job in the manufacturing sector and in non-manufacturing sectors that are relevant to the engineering profession, including universities.

9. Out of 125 respondents who work in non-manufacturing sectors, 70% hold graduate-level or entry-level positions for the undergraduate degree holders in the intended employers or work as engineers in non-manufacturing industries. Further breaking down the 70%, 60% hold graduate-level positions and another 10% as the entry-level executives in the targeted employers.

10. The Graduate Engineer at the Board of Education, Malaysia (BEM) is registered as a junior engineer and the graduates of the undergraduate degree programs accredited by the Engineering Accreditation Council (EAC) are eligible for the registration. For foreign degrees, the BEM automatically acknowledge the degrees accredited by the accreditation agencies of the Washington Accord members. For the degrees not accredited by the respective accreditation agencies of the Washington Accord, the EAC examines each case separately (based on the interviews of the BEM and EAC members)

Table 6. Current graduate-level positions at the intended employers by HELP2 and LEPP (in odds ratio)

	(1)	(2)	(3)	(4)
male	3.923***	3.777***	3.991***	3.949***
	(0.000)	(0.000)	(0.000)	(0.000)
yrsgrd_10	1.17	1.19	1.18	1.16
	(0.245)	(0.203)	(0.225)	(0.269)
spmave	1.460+	1.487+	1.503+	1.435+
	(0.074)	(0.063)	(0.062)	(0.085)
h2_1	0.855	0.713	0.620	0.581
	(0.691)	(0.592)	(0.370)	(0.310)
ugfldC3_1	2.373+	2.706	2.300+	2.424+
	(0.057)	(0.112)	(0.067)	(0.051)
ugfldC3_2	1.048	0.838	0.985	1.069
	(0.910)	(0.741)	(0.971)	(0.874)
intn_1	1.787	1.805	1.772	1.755
	(0.164)	(0.158)	(0.172)	(0.182)
rkqs10D_1	0.562+	0.535+	0.425+	0.573
	(0.091)	(0.071)	(0.066)	(0.103)
FSTSTU_1	0.962	0.946	0.966	1.082
	(0.951)	(0.932)	(0.957)	(0.903)
d1a3_1	3.628*	3.655*	3.499*	3.691*
	(0.036)	(0.035)	(0.043)	(0.034)
langeng	1.011	1.009	1.024	1.002
	(0.967)	(0.972)	(0.929)	(0.995)
jobchange_1	0.232***	0.225***	0.233***	0.170***
	(0.000)	(0.000)	(0.000)	(0.000)
h2Xugf_1_1		0.812		
		(0.808)		
h2Xugf_1_2		1.763		
		(0.479)		
h2Xrkq_1_1			1.836	
			(0.369)	
h2Xjob_1_1				2.089
				(0.278)
_cons	0.056	0.053	0.049	0.081
	(0.123)	(0.117)	(0.115)	(0.180)
N	249	249	249	249
chi2	51.47	52.42	52.28	52.65
p	0.0000	0.0000	0.0000	0.0000

Source: JICA graduate survey 2011.
Note: Exponentiated coefficients; p-values in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

3.2.2.2 Current earnings

The following regression analysis (OLS estimation) examines current monthly earnings and factors that have significant effects on the level of current earnings. In this analysis, the paper uses log transformed monthly earnings as a dependent variable. Table 7 shows the four specifications. The same variables used for the graduate-level positions in the current job analysis are used for the following analysis. The effect size of the four specifications has medium strength and explains 27 to 29% of the current earnings of the HELP2 and LEPP graduates.

Table 7. Current monthly earnings in MYR

	(1)	(2)	(3)	(4)
male	3.923***	3.777***	3.991***	3.949***
	(0.000)	(0.000)	(0.000)	(0.000)
yrsgrd_10	1.17	1.19	1.18	1.16
	(0.245)	(0.203)	(0.225)	(0.269)
spmave	1.460+	1.487+	1.503+	1.435+
	(0.074)	(0.063)	(0.062)	(0.085)
h2_1	0.855	0.713	0.620	0.581
	(0.691)	(0.592)	(0.370)	(0.310)
ugfldC3_1	2.373+	2.706	2.300+	2.424+
	(0.057)	(0.112)	(0.067)	(0.051)
ugfldC3_2	1.048	0.838	0.985	1.069
	(0.910)	(0.741)	(0.971)	(0.874)
intn_1	1.787	1.805	1.772	1.755
	(0.164)	(0.158)	(0.172)	(0.182)
rkqs10D_1	0.562+	0.535+	0.425+	0.573
	(0.091)	(0.071)	(0.066)	(0.103)
FSTSTU_1	0.962	0.946	0.966	1.082
	(0.951)	(0.932)	(0.957)	(0.903)
d1a3_1	3.628*	3.655*	3.499*	3.691*
	(0.036)	(0.035)	(0.043)	(0.034)
langeng	1.011	1.009	1.024	1.002
	(0.967)	(0.972)	(0.929)	(0.995)
jobchange_1	0.232***	0.225***	0.233***	0.170***
	(0.000)	(0.000)	(0.000)	(0.000)
h2Xugf_1_1		0.812		
		(0.808)		
h2Xugf_1_2		1.763		
		(0.479)		
h2Xrkq_1_1			1.836	
			(0.369)	
h2Xjob_1_1				2.089
				(0.278)
_cons	0.056	0.053	0.049	0.081
	(0.123)	(0.117)	(0.115)	(0.180)
N	249	249	249	249
chi2	51.47	52.42	52.28	52.65
p	0.0000	0.0000	0.0000	0.0000

Source: JICA Graduate Survey 2011.
Note: Standard errors in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Similar to the above two analyses, there are no significant differences between the HELP2 and the LEPP programs as to the level of current monthly earnings. As discussed below, however, one interaction term with the program dummy is significant. Also, similar to the graduate-level position in the current job discussed above, the results of the regression analysis indicate that most variables which were significant for the first employment are not significant for the level of current monthly earnings.

Across the specifications, several variables are positive and significant. Two variables from the post-graduation qualification and experiences, junior professional qualifications for engineers and English language proficiency, are significant. The above-mentioned Graduate Engineer at the Board of Education has a weak effect on the level of current earnings. Regarding English language proficiency, the existing studies of Malaysian higher education graduates indicate that oral and written language skills, especially English, are important factors for earnings (Ball and Chik 2001; Hoo et al. 2009). Because our survey does not have a question to collect actual data on graduates' English proficiency, such as TOEFL scores, the survey asked two questions to estimate the graduate's language ability (i.e., spoken and written English in a five-point scale). From the responses to these questions, we calculated the mean scores for self-estimated English proficiency. This variable is positive and significant. In addition, self-estimated Japanese proficiency has positive and significant effects on current earnings (not shown). For example, in the first specification of Table 7, the monthly earnings increase by five to six percent as the English or Japanese language proficiency score increases by one point.

Changing jobs is not significant until an interaction term with the program dummy is added to the specification (Table 7, column 4). The variable becomes positive and significant, while the interaction term is negative and significant. In other words, the simple effect of changing jobs has positive and significant effects on the current earnings for the LEPP graduates

who changed jobs, while it has negative and significant effects on the HELP2 graduates who changed jobs after the first employment.

4. Conclusion

The goal of this paper was to discover whether there are any differences between the two forms of cross-border higher education degree programs (i.e., traditional study abroad vs. twinning arrangements) in regards to the three dimensions of labor market outcomes (i.e., early employment, current positions, and current earnings). Except for an interaction term with the program dummy for the current earnings, the results of the regression analyses indicate that there are no significant differences between the HELP2 and LEPP programs on any of the three labor market outcomes. By and large, these findings support the first hypothesis of this paper, that there is no difference in the labor market outcomes of the two forms of cross-border higher education degree program. Thus, the findings imply that the twinning arrangement is a viable option for developing countries when the cost of the twinning arrangement is lower than traditional study abroad. In addition, as mentioned above, HELP2 requires one less year to obtain an undergraduate degree than does LEPP because the former completes the first year of the undergraduate program while the students are in Malaysia (see Table 1 for the differences between the two programs). Thus, the HELP2 graduates are in the labor market one year earlier than the LEPP graduates, which lowers the opportunity cost for the HELP2 graduates.

Regarding the second hypothesis that other educational variables have significant effects on these three dependent variables, the above findings indicate that educational variables at the departmental and institutional levels are relevant for early employment after graduation, but the effects of the educational variables are weak for the current positions and earnings. More specifically, for the first employment within one month of graduation, the degree subjects of

electrical and electronics engineering and mechanical engineering, internships, and the universities listed in the QS World Ranking for engineering and technical programs in Asia all have positive and significant effects. However, the significance of these variables, except for university rankings, is weak or non-existent in the two dimensions of current jobs.

The findings that the graduates in electrical and electronics engineering and mechanical engineering are favored for early employment indicates that HELP2 and LEPP generates the human resources to respond to the demands of these industries. Specifically, they encourage graduates to be productive workforce in these areas in order for Malaysia to develop the Malaysian manufacturing sector in which Japanese firms, particularly in the electrical and electronics industries, have a significant presence. This result is consistent with the findings of an earlier study, which was based on the program monitoring data collected on graduates of HELP 1 and 2 at the time of their graduation (Koda et al. 2011). That study also found that, over the past decade, the HELP programs had been successful in developing human resources for the intended industry. Nevertheless, this policy needs to be closely monitored. While degree fields have significant and positive effects on early employment, its effects are weak or non-existent regarding current work. This shift could suggest that there are close to sufficient graduates with engineering undergraduate degrees in those fields or that the demands of the targeted employers may be changing. Given that the HELP2 and LEPP graduates are heavily concentrated in the undergraduate electrical and electronics engineering and the mechanical engineering fields, this direction may need to be revisited.

As discussed, the importance of English language proficiency is widely reported by other studies, including those on Malaysia, and the findings of this paper support their findings. In addition to English, however, the findings of our paper indicate the importance of Japanese language proficiency for current earnings. The latter reflects the relatively large presence of

Japanese-related firms in Malaysia. Our findings imply that the demand for employees with Japanese proficiency is high along with English proficiency and that the graduates of the HELP2 and LEPP programs fill the needs of this market demand.

Finally, the findings on the positive effects of the university rankings on the first employment pose an interesting question: what aspects of educational training do the partner institutions provide? If the objective of engaging in a cross-border higher education degree program is merely to improve the odds of graduates being employed in their first job sooner, then partnerships with the higher education institutions listed in the university rankings would be important. However, the above findings also imply that skills such as language proficiency and professional qualifications are important after the first employment. During our field research, time and again we were told that one of the issues of studying in Japan is English language training. We were told that both HELP and LEPP graduates had pointed out the deficiency in English language training at Japanese universities. As the mobility of skilled labor intensifies within and between countries, higher education institutions have a role in developing such foundational skills prior to graduating from a university. When engaging in cross-border higher education degree programs, it is imperative for the partner countries, Malaysia in this paper, to check how their potential partners, Japanese universities in this paper, handle this professional training and guidance for their students' first jobs and beyond. Further analysis on the relationship of the post-graduation skills and qualifications to (i) the nature of the educational and employability skill training that is provided by the host institutions, (ii) the program and institutional characteristics, such as accreditation by the designated accreditation agencies of the Washington Accord, and (iii) the quality of host institutions (e.g., AHELO at OECD) may elucidate the selection of partnerships in cross-border higher education degree programs.

References

Ball, Rob, and Razmi Chik. 2001. Early employment outcomes of home and foreign educated graduates: The Malaysian experience. *Higher Education* 42: 171-89.

Bennington, Lynne, and Li Lai Xu. 2001. Reflections, reports and reviews: Relative benefits of offshore MBA study: An Australia-China twinning model. *Journal of Higher Education Policy and Management* 23 (2): 219-30.

Bratti, Massimiliano et al. 2004. Higher education outcomes, graduate employment and university performance indicators. *Journal of the Royal Statistical Society* 167 (3): 475-96.

Chik, Razmi Bin. 1997. Early employment outcomes of home versus foreign trained graduates: A Malaysian experience. PhD diss. , University of Stirling, UK.

Economic Planning Unit (EPU), Malaysia, 2006. Ninth Malaysia Plan 2006-2010. EPU: Putrajaya.

FASID 2007. *Mare-shia Toho Seisaku puroguramu nikansuru chosa*. Tokyo.

Hoo, Quah Chun et al. 2009. Are foreign trained graduates better than locals. *E-leader Tallinn* 2009: 1-10.

JBIC. 2001. Special assistance for project implementation (SAPI) for Malaysia: Higher education loan fund project (II)-final report (JICA project document).

Koda, Yoshiko, Takako Yuki, and Yeeyoung Hong. 2011. *Cross-border higher education for labor market needs: Mobility of public-funded Malaysian students to Japan over years*. Tokyo: Japan International Cooperation Agency Research Institute (JICA-RI).

Knight, Jane. 2006. Cross-border education: Conceptual confusion and data deficits. *Perspectives in Education* 24 (4):15-27.

———. 2008. Higher education in turmoil: The changing world of internationalization. Rotterdam: Sense Publishers.

Lancrin, Vincent. 2007. Developing capacity through cross-border tertiary education. In *Cross-border tertiary education: A way towards capacity development*. Paris: OECD and World Bank.

Lewis, Philip E. , and Graham R. Pratt. 1996. Growth in Malaysian demand for business education: The Australian response. *Journal of Higher Education Policy and Management* 18 (2): 207-16.

Lewis, Philip E. T. , and Danielle C. Shea. 1994. Malaysian demand for university education in Australia. Working Paper 46, Asian Research Centre/ Murdock University.

Machin, S. , and S. McNally. 2007. Tertiary education systems and labor markets. Paper commissioned by the Education and Training Policy Division for the Thematic Review of Tertiary Education, OECD, Paris.

Marginson, Simon, and Marjik van der Wende. 2007. To rank or to be ranked: The impact of global rankings in higher education. *Journal of Studies in International Education* 11 (3/4): 306-29.

Mason, Geoff et al. 2009. Employability skills initiatives in higher education: What effects do they have on graduate labour market outcomes? *Education Economics* 17 (1): 1-30.

McGuinness, Seamus. 2003. University quality and labour market outcomes. Working Paper Series 78, Northern Ireland Economic Research Centre (NIERC), Belfast.

McKenzie, Philipp et al. 2008. Harnessing educational cooperation in the EAS for regional competitiveness and community of building: Final report. Governments of EAS countries.

MOFA (Ministry of Foreign Affairs). 2010. *Japan's education cooperation policy 2011-2015*. Tokyo: International Cooperation Department , MOFA.

OECD and World Bank. 2007. *Cross-border tertiary education: A way towards capacity development*. Paris: OECD and World Bank.

Pyvis, David, and Anne Chapman. 2007. Why university students choose an international education: A case study in Malaysia. *International Journal of Educational Development* 27: 235-46.

Rumberger, Russel, and Scott L. Thomas. 1993. The economic returns to college major, quality and performance: A multilevel analysis of recent graduates. *Economics of Education Review* 12: 1-19.

Sirat, M. 2006. Transnational higher education in Malaysia: Balancing benefits and concerns through regulations. In *Transnational higher education in Asia and the Pacific region*, ed. F. Huang. , 109-26. Hiroshima: Research Institute for Higher Education, Hiroshima University.

Smith, Jeremy et al. 2000. Graduate employability: Policy and performance in higher education in the UK. *Economic Journal* 110 (464): F382-F411.

Wiers-Jenssen, Jannecke, and Sverre Try. 2005. Labour market outcomes of higher education undertaken abroad. *Studies on Higher Education* 30 (6): 681-705.

Annex Table 1. 2010 HELP and LEPP graduate tracer survey

	Sample frame				Survey response rate			Gender of responded graduates		
	Total on the lists	Valid response	No response/ invalid answer	No contact/ withdrawal (out of sample)	Valid response and response rate[a]	Not responded (including contact status unknown)	Total	Male	Female	Total
HELP1	311	146	125	40	146	125	271	114	32	146
%	100	46.95	40.19	12.86	53.87	46.13	100	78.08	21.92	100
HELP2[a]	**292**	**166**	**97**	**29**	**166**	**97**	**263**	116	50	166
%	100	56.85	33.22	9.93	63.12	36.88	100	69.88	30.12	100
JPA	**712**	**192**	**234**	**286**	**192**	**234**	**426**	130	62	192
%	100	26.97	32.87	40.17	45.07	54.93	100	67.71	32.29	100
Total[b]	1,315	504	456	355	504	456	960	360	144	504
%	100	38.33	34.68	27	52.5	47.5	100	71.43	28.57	100

Note:

a. The total number of graduates on the HELP2 list that we used for our survey is 292, which includes those who withdrew from the program without completing degrees. The number of students who were enrolled in Japanese universities in a project's record of HELP2 is 280, excluding those who withdrew from the program. For our survey, however, we could identify only nine students who withdrew from the program. Thus, there is a discrepancy of three graduates between the number reported by JICA's operational data and our list.

b. The total number of graduates on the lists are 1323. However, eight of them are excluded to avoid double counting between HELP2 and LEPP (transferred from HELP2 to LEPP). For the current paper, 356 HELP2 and LEPP graduates are used. Two outliers are excluded from the analysis.

HELP: Higer Education Loan Fund Project ; JPA: Jabatan Perkhidmatan Awam; LEPP: Look East Policy Program.

Abstract (in Japanese)

要約

「マレーシアと日本間で国境を越えて提供される
高等教育学位プログラムの労働市場における成果」

本論文は、マレーシアと日本との間で国境を越えて提供される二つの異なる高等教育学位プログラム（従来型の留学プログラムとツイニングプログラム）がもたらす労働市場での成果を考察している。具体的には、主に工学部系学部卒業者への質問紙調査に基づき、二つのプログラム間で卒業生の就業状況に有意な違いが見られるか、また他のどのような要因が就業状況に関係しているかを分析している。回帰分析の結果によると、二つのプログラム間では、学部取得直後の就業までの期間、現職における職階、現職における月収のいずれにおいても大きな差異は見られない。他方、教育に関する変数のうち学位取得学科、インターンシップ経験、学位取得大学のランキングが、最初の雇用と有意に関係している。現在の職業については、卒業後に得たジュニア・エンジニアとしての資格や英語や日本語の技能が重要であることが示されている。これらの結果は、労働市場での成果を留学目的として捉えた場合、二国間のツイニングプログラムも人材育成の形態として有用であることをを示唆している。

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

JICA-RI Working Paper No. 29

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

JICA-RI Working Paper No. 39

Cross-Border Collaborative Degree Programs in East Asia:
Expectations and Challenges

Takako Yuki, Yeeyoung Hong, Kyuwon Kang, and Kazuo Kuroda