FACTORS INFLUENCING THE INTENTION TO MIGRATE AMONG ENGINEERING STUDENTS IN MALAYSIA: AN EXPLORATORY STUDY

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Abstract: Human capital and innovation plays a crucial role for economic growth of a country. To advance in the development of talents, Malaysian government has developed strategies such as the introduction of the Higher Education Strategic Plan to increase the number of graduates with tertiary education particularly in the field of science, engineering and ICT to 33% by 2020. Moreover, Intellectual Properties Corporation of Malaysia (MyIPO) was created to foster new innovation among Malaysians and to protect infant inventions. But with all various strategies to promote growth, Malaysia are struck with an issue of brain drain, the flight of high skilled human capital to a foreign country with no intention to return home. In 2000, there were 184,000 Malaysian with tertiary-education who have migrated for economic reasons and in 2010, it was estimated about 1 million Malaysian living abroad (The World Bank, 2011). Brain drain could hinder Malaysia’s economic growth due to outflow of skilled human capital and may distort growth of innovation of the country. Hence, this paper aims to investigate the root of the problem which investigates the factors that influence migration intention among engineering students in selected public and private higher learning institutions in Malaysia. Both descriptive and inferential statistical tests will be employed in data analysis from the survey data. The findings should provide exploratory information for Ministry of Higher Education, Malaysia and other relevant stakeholders in understanding international migration and the likelihood of the intention to migrate among future engineers.

Keywords: Brain Drain, Human Capital, Migration Intention, Innovation, Engineering, Students.

Introduction

Science and technology plays a crucial role in helping the economic development of a country. Either by expanding national income through improving the production of good and services or create new jobs through the birth of new entrepreneur in applying latest technology on their business.

In achieving the status of high income nation, Malaysian Prime Minister Najib Razak introduced the Transformasi Nasional '50 (TN50) with a vision to transform Malaysia into a high income nation by year 2050. To achieve this Malaysian government has invested heavily in science and technology sector such as opening a Digital Free Trade Zone. The government has allocated a sum amount of budget and tax incentives for SMEs that applied new technology in their business
such as the Government Guarantee Loans to enable SMEs to automate their production, Accelerated Capital Allowance for automation equipment and Capital Allowance Incentive for ICT equipment.

The 11th Malaysian Plan reported that engineering related sector such as manufacturing and construction contribute to a large share of GDP. Through the plan, the Malaysian government will increase the number of technical and vocational students through Technical and Vocational Education and Training (TVET) and introduced the Industry Graduate Development Centre (AIGDC) to overcome job mismatch in strategic sector such as automotive, biotechnology and health science.

The Ministry of Higher Education (MOHE) also plays a role in helping the government to achieve the high income nation status by published The Higher Education Strategic Plan 2020 in 2015. The plan includes to increase the number of workers from tertiary education to 33%, produce numbers of entrepreneurs and technopreneurs, improve the effectiveness of research universities, introduced the Malaysian Technical Universities Network and also integrate science, technology and engineering in universities curriculum.

Nevertheless with all the government’s policies, programmes and plans to produce a large number of high skilled human capital, Malaysia is faced with a phenomenon called the “Brain Drain”. Brain Drain as defined by Beine, Docquier & Rapoport (2008) is an international transfer of capital in a form of human capital, mainly applies to the migration of highly skilled or educated individuals from developing to developed countries.

An economic report published by the World Bank in 2010 reported an estimated 1 million of Malaysians are living abroad. In 2011, Utusan Malaysia has reported that 500 Malaysian students under the Department of Civil Service (JPA) scholarship who studied abroad do come back to Malaysia after completing their study. If this trend continues and not addressed fast by the Malaysian government, the nation may not achieve a developed status by 2050.

This study aims to investigate the factors that influence migration intention among engineering students in selected public and private higher learning institutions in Malaysia. This investigation is important to understand clearly the brain drain phenomenon as to stop the country from losing the highly skilled and educated individuals. Brain drain may have a negative impact on per capital income growth and the development of Malaysia. The manifestation from these will be Malaysia may not achieve a developed country status in 2020 if this trend are not treated swiftly and efficiently by the government.

Theory of Migration

The earliest recorded work on theory of migration and migration activities were titled ‘Law of Migration’ by E.G. Ravenstein (1885) in Journal of Statistical Society of London. He discussed about the activities rural-urban migration in England, Scotland, Ireland, & Wales. In 1966, the theory was expanded by Lee (1966) in a literature called ‘Theory of Migration’. He expanded the Ravenstein’s theory and listed out variables that influence individuals to migrate. This variables include salary, benefits, workplace, political situation, racial discrimination, and technological advancement.

Factors of Migration

As found in the literature, there are various factors that influence an individual’s decision to migrate.
Private Benefits and Salary
The factors include attractive salary, allowances, benefits and allowances. Cash and non-cash benefits are one of the main reasons why people migrated abroad and usually to a more a developed country. A study by Junaimah, Yusliza & Khoo in 2009 on intention to migrate among 150 accounting students in University of Science Malaysia (USM), revealed that high salary and benefits program had significant and positive effects on brain drain.

A study by Lim, Junaimah, & Hasnah (2004) in identifying factors that influence Penang professional engineers to migrate found a similar results. Social welfare such as cash and non-cash benefit given by firms in foreign countries influence the engineers’ intention to migrate abroad.

A conceptual study by Quah, Siti Rohaida, & Guok (2009) also pointed out that better salary offered by firms in foreign country has attracted numbers of Malaysian diaspora to migrate abroad based on the past research findings.

A similar situation are also occurred in African. A study by Dzvimbo (2003) found that skilled workers from African region such as Algeria, Angola, Morocco, Mozambique and The Gambia tend to migrate to a developed country due to higher salary. He give an example where a Kenyan doctor can earn four or five times higher in United States or United Kingdom.

Workplace Environment
Workplace environment includes workplace environment, employee’s motivation, unable to participate in decision making, expressing creativity on the job, career advancement, in job training, job opportunities and also job mismatch. A study conducted by Jian, Poh, Tee, & Shi (2013) found that from 200 tertiary education students from various universities and colleges in Malaysia, there were a significance relationship between intentions to migrate among undergraduate students, work stress and workplace environment.

Past conceptual study also recognize this situation as factor of migration such as by Junaimah & Yusliza (2011) in constructing a conceptual framework to identify the propensity to leave by Malaysian and also by Junaimah, Ahmad Bashawir, Mohd Hasanur, Muhammad Subhan & Rabiu Islam (2015) in creating a conceptual framework for factors of migration among Malaysian diaspora in Singapore.

Though the situation are different among accounting students and professionals. Where study by Junaimah, Yusliza & Khoo (2009) found that there is no significant relationship between factors related with “finding more promising jobs and more challenging job scopes” and the reasons to migrate.

Political Stability
Political stability include a safer environment, political stability, bureaucracy and government policies and how it influence the students to migrate. A study in Balochistan, Pakistan by Mohyuddin & Ulllah (2015) found that civil unrest and political instability has become a main driver Pakistan’s brain drain. Dzvimbo also point out a similar situation where political instability has become a factor for African to migrate to a more politically stable developed country.
Though for Malaysia this factor can be hit or miss. A study by Lim, Junaimah, & Hasnah (2004) investigating how ‘Human Security’ influence professional engineers’ decision to migrate. Human security include respondent’s perception toward safety, police performance and judicial system of the country. The study found that human security are statistically insignificant and do not influence the engineers to migrate abroad.

**Family and Social Connection**
A past study by Ukwatta (2010) has identified that Sri Lankan tend to migrate to abroad due to family factors. This factors include to build and buy house for the family, to find a better education for their children, family obligation and to recover husband’s illnesses. But only 6% of respondents agreed that family factors is the reason for them to migrate and 94% stated economic factors are reason for the to migrate.

Haug (2008) also studies migration activities due to family and social connections. In the case study of Bulgaria that has emigrate abroad, 36.8% of long-term immigrant agreed that they will migrate alone and bring their family later and 31.6% of them will migrate with their family. Haug also applied logistic regression in identify the probability of an Italian immigrant in Germany to return to Italy relative with the number of family members in a household. The author found out that the probability for the Italian immigrant to stay increase as number of household increases.

**Methodology**
This paper aims to investigate the root of the problem which investigates the factors that influence migration intention among engineering students in selected public and private higher learning institutions in Malaysia.

The survey were developed based on past research and studies. The survey would answer the aim of the research. Questions such as whether if they have any family members or friends living, working or staying abroad; they have any intention to migrate; and which country they prefer to migrate the most were posted to the respondents.

Both descriptive and inferential statistical tests are employed in data analysis from the survey data. The findings should provide exploratory information for Ministry of Higher Education, Malaysia and other relevant stakeholders in understanding international migration and the likelihood of the intention to migrate among future engineers.

**Data Analysis**

**Demography**
Our empirical analysis is based on a survey conducted on 227 engineering students from public and private universities. Data was gathered through survey using self-administered developed for the study. The profile of the respondents is tabulated in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=227)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>134</td>
<td>59.0</td>
</tr>
</tbody>
</table>
By gender, 59% of the respondents are male and 41% are female. By institutions, 76.7% of respondents are from public universities and 23.3% are from private universities.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>93</td>
<td>174</td>
</tr>
<tr>
<td>Private</td>
<td>41.0</td>
<td>76.7</td>
</tr>
</tbody>
</table>

In gauging the factors that influence the intention to migrate among the engineering students respondents were asked whether they have anyone related to them living, working or studying abroad. Figure 1 shows that 65.8% of respondents has friends studying abroad and 45.9% has relatives study abroad. For living abroad, 39.6% stated that they have relatives who live abroad and 34.4% are friends.

![Figure 1: Family or Friends living/working/studying abroad](image)

Migration Intention

Our main variable of interest is based on responses to the following question: “Do you have any intention to migrate abroad after you finish your study?” The possible answers are “within 1 year after graduation”, “within the next 5 years after graduation”, “within 10 years after graduation” and “not at all”. 35% reported they have no intention of moving abroad after graduation, 32% plan to migrate within the next five years after graduation, as presented in Figure 2.
Further analyses in table 2 showed a significant association between types of institutions and intention to migrate ($p = 0.04 < 0.05$). More respondents from the public universities are inclined not to migrate abroad (40%) as compared to 17% reported by respondents from the private universities. A much higher percentage amongst the private universities students reported having the intention to migrate, 28.3% and 41.5%, within 1 year after graduation and within 5 years after graduation, respectively. No significant difference is observed across gender on the intention to migrate. However, the survey found that within the first year of graduation more male has the intention to migrate while more female are migrating only after five years of graduating as shown in table 2.

### Table 2: Intention to migrate among genders and institution

<table>
<thead>
<tr>
<th>Variables</th>
<th>Within 1 Year After Graduation</th>
<th>Within the Next 5 Years After Graduation</th>
<th>Within the Next 10 Years After Graduation</th>
<th>No At All</th>
<th>Total</th>
<th>Chi-Square (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18.50%</td>
<td>27.70%</td>
<td>19.20%</td>
<td>34.60%</td>
<td>100%</td>
<td>0.196</td>
</tr>
<tr>
<td>Female</td>
<td>16.1%</td>
<td>38.7%</td>
<td>10.8%</td>
<td>34.4%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td><strong>Institution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.04*</td>
</tr>
<tr>
<td>Public</td>
<td>14.1%</td>
<td>29.4%</td>
<td>16.5%</td>
<td>40.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Private Institution</td>
<td>28.3%</td>
<td>41.5%</td>
<td>13.2%</td>
<td>17.0%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3, list the top five countries with the highest percentage propensities to migrate among the students based on gender.

Japan is the most preferred country to migrate among male and female students. 17.2% of male prefer to migrate in Japan and 19% of female student stated the same. For male students second highest preferred country to migrate after Japan are United Kingdom with 15.6% followed by Australia (14.8%), Canada (7.4%) and New Zealand (7.4%)

For female students most preferred country to migrate after Japan are New Zealand with 15.5% followed by Australia (14.3%), United Kingdom (13.1%) and Canada (8.3%)

**Figure 4: Country Most Preferred to Migrate by Type of Institution**

Figure 4, list the top five countries with the highest percentage propensities to migrate among the students based on type of institution.
Japan has the highest percentage for most preferred country migrate among public university students by 18.6% followed by Australia (16.7%), United Kingdom (15.4%), New Zealand (13.8%) and Canada (4.5%).

In contrast, Canada is the most preferred country to migrate among private university students by 18.0%. This is followed by Japan (16.0%), United Kingdom (12.0%), Australia (8.0%) and New Zealand (4.0%).

Table 3: Selection Criteria for Migrating

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Not Important</th>
<th>Neutral</th>
<th>Important</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attractive Salary</td>
<td>0.9</td>
<td>5.9</td>
<td>93.2</td>
<td>100%</td>
</tr>
<tr>
<td>Employment Opportunity</td>
<td>0.9</td>
<td>4</td>
<td>95.1</td>
<td>100%</td>
</tr>
<tr>
<td>Career Advancement</td>
<td>0.4</td>
<td>5.8</td>
<td>93.8</td>
<td>100%</td>
</tr>
<tr>
<td>Challenging Job Scope</td>
<td>2.7</td>
<td>25.6</td>
<td>71.7</td>
<td>100%</td>
</tr>
<tr>
<td>Employment Benefits</td>
<td>1.3</td>
<td>6.3</td>
<td>92.4</td>
<td>100%</td>
</tr>
<tr>
<td>Safer, Low Crime Rate</td>
<td>0.9</td>
<td>8.5</td>
<td>90.6</td>
<td>100%</td>
</tr>
<tr>
<td>Free Education</td>
<td>3.6</td>
<td>15.2</td>
<td>81.2</td>
<td>100%</td>
</tr>
<tr>
<td>Family Members Abroad</td>
<td>21</td>
<td>39.3</td>
<td>39.7</td>
<td>100%</td>
</tr>
<tr>
<td>Friends Living/Working Abroad</td>
<td>8.9</td>
<td>24.6</td>
<td>66.5</td>
<td>100%</td>
</tr>
</tbody>
</table>

Factors influencing the intention to migrate abroad were gauge from the answers given by respondents on the importance of criteria for migrating to other countries. Table 3 presents the feedback on the important criteria for migrating abroad. 95.1% reported that employment opportunity is an important criteria in making a decision to migrate. This followed by career advancement (93.8%), attractive salary (93.2%), employment benefits (92.4%) and low crime rate (90.6%).

21.0% of respondent stated that family members that living or working abroad are not an important criteria in making decision to migrate. Followed by friend living or working abroad (8.9%), free education (3.6%) and challenging job scopes (2.7%)

Conclusion

In conclusion this study found 65% of the engineering students surveyed (from public and private universities) have the intention to migrate at some point of time after graduation. Findings of this study are supported by the theory of migration discussed by Lee (1966). Employment opportunities, career advancement, salary, employment benefits and safer and lower crime rate countries are the pull factors that influenced their intention to migrate. This study have identified similar factors also found by studies done by Junaimah, & Hasnah (2004) and Junaimah, Yusliza & Khoo (2009). Unlike study done by Jian, Poh, Tee, & Shi (2013) this study did not find job challenges to be important reason for migration. Efforts and programmes to curtail international migration by the government and other relevant stakeholders in Malaysia should consider these economic and noneconomic factors to be effective.
References