EFFECTS OF FOREIGN WORKER ON SECTORALS, SKILLS AND LABOUR MARKET OUTCOMES

By

KAMARUL HIDAYAH BINTI ABDUL HAMID

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia in Fulfilment of the Requirement for the Degree of Doctor of Philosophy

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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May 2020

Chairman   **: Associate Professor Rusmawati Said, PhD**
Faculty   **: School of Business and Economics**

The expansion of Malaysia's export-oriented manufacturing and construction sectors in the 1980s was met with serious local labour shortages. As a short-term solution for this conundrum, the government allowed the importation of foreign workers. The absence of a long-term foreign worker policy has however resulted in the influx of unskilled documented and undocumented foreign workers. These workers are claimed by some to affect the economy in a negative way. Though new or improved policies to resolve these challenges are of immense urgency, empirical studies on the impact of foreign workers on the economy and labour market have been shrouded by data inconsistencies lent by weaknesses inherent in labour statistics and clandestine foreign workers, both of which have obscured the exact number of foreign workers. Consequently, these studies have returned ambiguous results, inhibiting the development of effective strategies. To remedy these shortcomings, this study used an improved dataset of foreign workers to (a) analyse the sectoral impact of foreign worker; (b) investigate the effect of foreign worker by skill levels; and (c) investigate the effect of foreign workers on labour market outcomes.

In the first objective, the study measured the sectoral impact of foreign worker. Malaysia's overreliance on foreign workers in certain sectors, such as manufacturing and agriculture, have created much concern about their capability to grow consistently, as these workers are typically unskilled. To measure sectoral employment impact, the study calculated the foreign worker employment multiplier. The results indicate that the largest foreign employment multipliers were in the construction residential, palm oil, and rubber products subsectors. On the other hand, in domestics appliances machinery equipment, manufacture of office, accounting and computing machinery, and manufacture of radio and television

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subsectors, the inflow of foreign workers would create less than a job. These findings thus suggest that foreign workers have a substantial contribution to the sectors in which they are heavily employed in, but only marginal effects to those otherwise.

The second objective was accomplished using the Computable General Equilibrium-Malaysia Foreign Labour Analysis (CGE-MAFLA) model. In this model, labour was disaggregated into four skill types. This exercise produced three important findings. First, the entry of highly skilled foreign workers may help balance the labour market structure. Second, in certain sectors, a competitive relationship exists between highly skilled and skilled workers, and between semiskilled and unskilled workers. Third, the direction and intensity of the impact depends on the nature of the sector itself, such as its specific role in the national economic system and required professional knowledge or skills. Taken together, these results are useful to balance the unbalanced labour market. The entry of highly skilled foreign worker should be encouraged, while unskilled ones must be reduced, as the former has a greater positive impact on local labour demand.

In the third objective, the study estimated the impact of foreign workers on two indicators of labour market outcome, namely wage and unemployment rate. The results suggest that an increase of foreign workers of a specific skill group would reduce the wages of local workers of the same group and increase those of complementary groups. An influx of unskilled foreign workers would thus depress the wages of unskilled labourers and increase those of high skilled ones, enlarging the wage gap between the two groups. Surprisingly, semiskilled foreign workers only cause unfavourable effects on semiskilled local labour, while creating favourable effects on the wages of all other skill groups. These results thus suggest that the impact of foreign workers on wages largely depend on their skills. In terms of unemployment, the entry of a specific skill group will increase unemployment within the same group while decreasing that of other groups. An increase of highly skilled foreign workers by four to eight percent reduces total unemployment. On the contrary, the inflow of other skill groups, especially semiskilled, increases domestic unemployment. Altogether, the results imply the necessity to attract skilled foreign workers to and limit unskilled foreign workers from entering the market. To depend on the latter would cause wages to stagnate and displace local workers.

The study has produced several policy implications. First, the Malaysian government should prioritise the entry of higher skilled foreign workers into the labour market. The model showed that higher skilled labour could create larger benefits than lower skilled labour in the primary sector and in some tertiary sectors. Second, the policy implication is clear: if the government's primary objective is to decrease the unemployment rate, the appropriate policy is to encourage the inflow of highly skilled labour. Of all skill groups of foreign workers, only the highly-skilled group is helpful in reducing the total unemployment rate, most likely by creating jobs for the semiskilled and unskilled labour force.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KESAN KEMASUKAN PEKERJA ASING TERHADAP SEKTORAL, KEMAHIRAN DAN HASIL PASARAN BURUH

Oleh

KAMARUL HIDAYAH BINTI ABDUL HAMID

Mei 2020

Pengerusi   **: Profesor Madya Rusmawati Said, PhD**
Fakulti   **: Sekolah Perniagaan dan Ekonomi**

Perkembangan sektor perkilangan dan pembinaan yang berorientasikan eksport di Malaysia pada tahun 1980-an telah menyebabkan berlakunya kekurangan tenagakerja tempatan yang serius. Sebagai penyelesaian jangka pendek, kerajaan telah membenarkan pengimportan pekerja asing. Ketiadaan polisi jangka panjang pada ketika itu telah menyebabkan limpahan kemasukan pekerja asing samada yang didokumentasi dan tidak didokumentasi. Pekerja asing ini telah menyebabkan berlakunya kesan negatif kepada ekonomi. Walaupun keperluan yang mendesak kepada penciptaan dasar-dasar baharu yang lebih baik untuk menyelesaikan cabaran ini, kajian empirikal mengenai kesan pekerja asing terhadap ekonomi dan pasaran buruh menjadi lebih sukar disebabkan data yang tidak konsisten terutama kelemahan rekod statistik buruh dan kebanjiran pendatang tanpa izin (PATI) yang tidak dapat direkodkan, kedua-duanya faktor ini menjadikan bilangan sebenar pekerja asing tidak diketahui. Akibatnya, kajian berkaitan pekerja asing kurang berkesan dan tepat, seterusnya menghalang pengkaji mencadangkan suatu dasar yang lebih berkesan. Untuk memperbaiki kekurangan ini, kajian ini telah menggunakan dataset yang lebih baik berkaitan jumlah pekerja asing untuk (a) menganalisis kesan pekerja asing mengikut sektor (b) menyiasat kesan pekerja asing, mengikut empat tahap kemahiran; dan (c) menyiasat kesan pekerja asing ke atas hasil pasaran buruh.

Objektif pertama, kajian ini mengukur kesan pekerja asing mengikut sektor. Kebergantungan pekerja asing di sektor tertentu, dan telah menimbulkan kebimbangan mengenai keupayaan mereka untuk berkembang secara konsisten, kerana pekerja asing ini tidak mempunyai kemahiran. Untuk mengukur kesan kepada pekerjaan mengikut sektor, kajian ini mengira pengganda pekerjaan pekerja asing. Hasil kajian menunjukkan bahawa pengganda pekerjaan pekerja asing terbesar adalah di sektor pembinaan kediaman, kelapa sawit dan produk getah Walaubagaimanapun, di sektor keperluan mesin alatan domestik,pembuatan

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barangan pejabat, perakaunan & perkomputeran, dan pengeluar alatan radio dan televisyen merekodkan kesan perwujudan pekerjaan yang paling rendah. Penemuan ini mencadangkan bahawa pekerja asing mempunyai sumbangan besar kepada sektor-sektor di mana jumlahnya adalah banyak, manakala kesan marginal berlaku kepada sektor yang sebaliknya.

Objektif kedua dicapai dengan menggunakan model *CGE*-Analisis Pekerja Asing Malaysia (CGE-MAFLA). Dalam model CGE-MAFLA, pekerja telah dibahagikan kepada empat tahap kemahiran. Simulasi ini menghasilkan tiga penemuan penting. Pertama, kemasukan pekerja asing berkemahiran tinggi dapat membantu mengimbangi struktur pasaran buruh. Peningkatan pekerja tersebut menyeimbangkan pekerjaan semua kumpulan kemahiran pekerja di kebanyakan sektor. Kedua, dalam sektor tertentu, hubungan persaingan wujud antara pekerja berkemahiran tinggi dan mahir, dan antara pekerja separuh mahir dan tidak mahir. Sebagai contoh, dalam sektor pembuatan dan pembinaan, kerajaan harus membenarkan kemasukan pekerja asing yang berkemahiran tinggi, mahir, dan separuh mahir, kerana mereka mempunyai kesan pelengkap kepada pekerja tempatan. Ketiga, kesannya bergantung pada ciri sektor itu sendiri, seperti peranan sektor itu dalam sistem ekonomi berdasarkan pengetahuan atau kemahiran profesional yang diperlukan. Secara keseluruhan, hasil kajian ini berguna untuk menyeimbang pasaran buruh. Kemasukan pekerja asing berkemahiran tinggi harus digalakkan, semestara pekerja asing tidak mahir harus dikurangkan, kerana mempunyai kesan berganda terhadap permintaan pekerja tempatan.

Objektif ketiga, kajian mengaanalisis kesan pekerja asing terhadap dua indikator hasil pasaran buruh, iaitu upah dan kadar pengangguran. Keputusan kajian mendapati bahawa peningkatan pekerja asing kumpulan kemahiran tertentu akan mengurangkan gaji pekerja tempatan dalam kumpulan kemahiran yang sama, dan meningkatkan gaji bagi kumpulan kemahiran yang bersifat penggenap. Kemasukan pekerja asing yang berkemahiran rendah akan mengekang gaji pekerja berkemahiran rendah dan meningkatkan gaji pekerja berkemahiran tinggi, membesarkan jurang antara kedua-dua kumpulan. Pekerja asing separa mahir hanya menimbulkan kesan yang tidak baik terhadap buruh tempatan separa mahir sahaja, dan memberi kesan yang menggalakkan ke atas gaji bagi semua kumpulan kemahiran yang lain. Kemasukan pekerja asing separa mahir dapat menaikkan gaji pekerja di dalam pasaran buruh bagi semua tahap kemahiran. Penemuan ini menunjukkan bahawa kesan pekerja asing terhadap gaji sebahagian besarnya bergantung kepada kemahiran mereka. Dari segi pengangguran, kemasukan pekerja asing bagi kemahiran tertentu akan meningkatkan pengangguran dalam kumpulan yang sama dan mengurangkan kumpulan kemahiran yang lain. Peningkatan pekerja asing yang berkemahiran tinggi sebanyak empat hingga lapan peratus mengurangkan jumlah pengangguran. Sebaliknya, kemasukan kumpulan kemahiran yang lain, terutamanya separuh mahir, akan meningkatkan pengangguran. Secara keseluruhannya, hasil kajian menyimpulkan keperluan untuk mengimport pekerja asing mahir dan mengehadkan pekerja asing yang berkemahiran rendah daripada memasuki pasaran. Kebergantungan kepada pekerja asing sedia ada kini hanya akan memperlahankan kenaikan gaji dan pengambilan pekerja tempatan untuk bekerja.

Kajian ini telah menghasilkan beberapa implikasi dasar. Pertama, kerajaan Malaysia harus memberi keutamaan kepada kemasukan pekerja asing yang berkemahiran tinggi ke dalam pasaran buruh. Model ini menunjukkan bahawa buruh berkemahiran tinggi boleh menghasilkan manfaat yang lebih besar daripada buruh berkemahiran rendah dalam sektor utama dan dalam beberapa sektor tertiari. Kedua, implikasi dasarnya adalah jelas: jika objektif utama kerajaan adalah untuk menurunkan kadar pengangguran, dasar yang sesuai adalah dengan menggalakkan kemasukan buruh berkemahiran tinggi. Daripada semua kumpulan kemahiran pekerja asing, hanya kumpulan yang berkemahiran tinggi membantu dalam mengurangkan jumlah kadar pengangguran, dan ianya juga dapat mewujudkan pekerjaan untuk tenaga kerja separuh mahir dan tidak mahir.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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Declaration by graduate student

I hereby confirm that:
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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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LIST OF ABBREVIATIONS

BNM	Bank Negara Malaysia
CES	Constants Elasticity of Substitution
CGE	Computable General Equilibrium
CGE-MAFLA	Computable General Equilibrium-Malaysia Foreign Labour Analysis
CIDB	Construction Industry Development Board
CITP	Construction Industry Transformation Programs
DOSM	Department of Statistics Malaysia
EMP	Eleventh Malaysia Plan
EPU	Economic Planning Unit
ETP	Economic Transfer Program
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
ILMIA	Institute Labour Market Information and Analysis
ILO	Institutes Labour Organization
IO	Input Output
ISCO	International Standard Classification of Occupations
KRI	Khazanah Research Institutes
LFS	Labour Force Survey
MAPA	Malayan Agricultural Producers Association
MASCO	Malaysia Standard Classification of Occupations
MNA	Malaysia National Account
MOA	Ministry of Agriculture
MOHA	Ministry of Home Affairs
MOHR	Ministry of Human Resources
MoU	Memorandum of Understanding
NEP	New Economic Policy
NER	National Employment Return
NKEA	National Key Economic Areas
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Square
SAM	Social Accounting Matrix
TVET	Technical and Vocational Education and Training
UK	United Kingdom
US	United State
VAR	Vector Autoregressive

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Malaysia is one of the top destinations for South-South migration due to its relatively advanced economic infrastructure and political stability. In fact, the country had begun importing workers during the occupation of British colonials, particularly for plantation and mining (Wong & Rigg, 2010). In the 1970s, Malaysia began liberalising its economy, marked with the introduction of the New Economic Policy (NEP) in 1971. This policy was a massive driver of economic growth, driving urbanisation and labour participation. Its introduction coincided with the structural shift of the Malaysian economy from agriculture to export-oriented manufacturing, witnessing much growth in terms of capital inflow and labour absorption (Thillainathan & Cheong, 2016).

Malaysia's increasing number of foreign workers is consequent of a number of pull and push factors. The first pull factor is the shortage of labour in the domestic industries, first during the economic structural shift from agriculture to manufacturing, which caused local workers to emigrate to urban areas to work in factories, and second during the boom of export-oriented manufacturing in the late 1970s and early 1980s. In both cases, the government saw labour importation as a short-term solution for labour shortages in the critical economic sectors (agriculture, manufacturing, construction, services) (Gill, 1988; Devadason & Meng, 2014).

The second pull factor is the changing preference of locals due to the rising level of education: the number of secondary and tertiary graduates in the country have persistently improved since the 1980s. This has shifted the job preference of locals, who moved to better-remunerating jobs in urban areas, creating shortages in low-skilled jobs. Once more, foreign worker were seen as the solution. The third pull factor is the reactionary and short-term foreign labour policies (Devadason & Meng, 2014). During the start of the above mentioned industrial boom, particularly in the 1970s, foreign workers were freely recruited into the industry.

The push factors are a combination of social and political factors in neighbouring countries. Civil unrest and political hegemony, as well as low wages and lack of opportunities in their home countries, attracted foreign worker to migrate to Malaysia. These labour-supplying nations were also growing slower economically relative to Malaysia (Manning, 2006). The resulting outcome from these pull and push factors are the consistently increasing number of foreign worker in the Malaysian labour force.

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The government has introduced numerous initiatives to control the inflow of unregistered workers and manage in-migration of documented workers. Initial efforts began in 1982, when the Committee for the Recruitment of foreign worker were established. Since then, Malaysia has introduced a number of policies. These include memoranda of understanding (MoU) and other such bilateral agreements with sending countries, the first of which was with Indonesia in 1982. Annual levies were only introduced in 1991. The levies differ by skill group and sector, and they have been continually changed throughout the years. Bans and import freezes were also a frequent policy, occurring 11 times between 1982 and 2010.

Figure 1.1 shows the changes in the foreign worker population over the years. The bullish economy in the period preceding the 1997 Asian financial crisis had witnessed a steep upwards trend, but as Malaysia entered into recovery following the recession, foreign workers were the first one to be reduced. This period was marked with the issuance of several temporary recruitment freezes for several nationals due to various issues, as well as the introduction of more stringent rules. The jump in figure and share in 2011 could be attributed to the 6P program[1], an amnesty initiative to legalise illegal foreign worker. As of 2017, their share of the total workforce was 16 percent—one point above the ceiling defined in the Eleventh Malaysia Plan (EMP). However, this number precludes undocumented workers, who are estimated to be between 1.9 and 4.6 million individuals (Loh, Simler, Wei, & Yi, 2018).
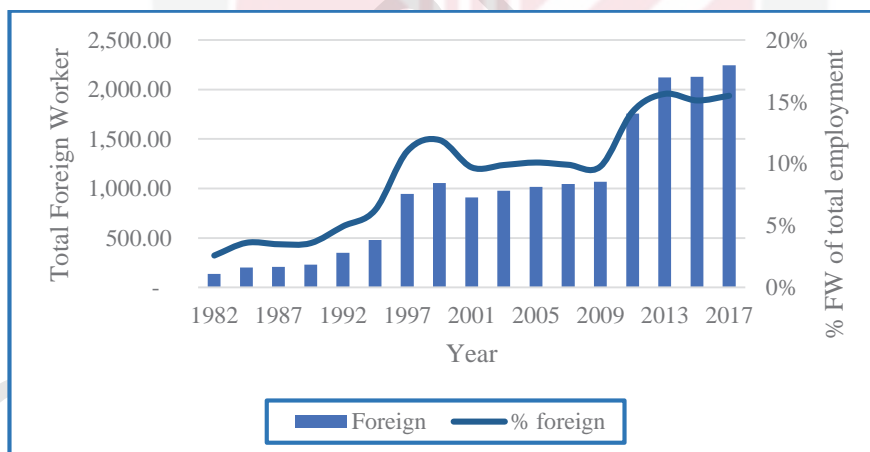
Figure 1. 1: Total and share of foreign workforce in Malaysia (1982-2018)
(Source: Department of Statistics, Labour Force Survey (2019a))

Though the aggregate picture suggests that the share is approximately hitting the pre-defined target of 15 percent, a sectoral view of the same statistic provides a

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[1] The 6P program is an acronym of six Malay words: *pendaftaran* (registration), *pemutihan* (legalisation), *pengampuan* (amnesty), *pemantauan* (monitoring), *penguatkuasaan* (enforcement), and *pengusiran* (deportation). The program resulted in the recording of an additional 1.3 million FW, though only around 600 thousand workers remained working in Malaysia (Kassim, 2014).

contrasting picture, suggesting that certain sectors, especially ones with substantial contributions to the national economy, are still dependent on foreign worker. As Table 1.1 shows, the share of foreign worker in agriculture has gone beyond the mandated 15 percent. In 2016 and 2017, their share of total employment has reached 37 percent, suggesting the sector's dependency on foreign worker. In other sectors, an almost similar pattern can be observed. The employment of foreign worker has steadily increased since 2010. In manufacturing, the share of foreign worker of total employment has risen by 99 percent, in construction 58.4 percent, services 56.1 percent, and mining 105 percent. These shares included only legal workers.

Table 1. 1: Sectoral distribution and share of total employment of foreign worker

Sector	2010		2013		2016		2017	
	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment
Agriculture	32.1	23.5	21	22.2	27.2	37.3	27.3	37.4
Manufacturing	17.9	10.3	23	18.4	23	21.2	23	20.5
Construction	14	14.9	17.3	24.7	12.7	22.4	13.2	23.6
Services	35.7	5.7	38.2	8.5	36.9	9.2	35.9	8.9
Mining	0.3	6.1	0.5	9.6	0.2	4.9	0.5	12.5

(Source Department of Statistics, Labour Force Survey, various years)

Though the government has introduced various capital upgrading initiatives, employers maintain their preference for foreign workers. As Table 1.2 shows, the majority of foreign workers in Malaysia are lower skilled[2]. In fact, these workers have constituted more than half of total employment in the country since 2013. Around 52.9 percent of foreign workers in 2017 were semiskilled, making up 17.3 percent of total employment. In the same year, unskilled foreign workers constituted almost half of foreign workers, but they represented more than half of total employment. These unskilled workers were seemingly concentrated in the primary and secondary industries, that is, agriculture, construction, and manufacturing (see Table 1.1). Industry-specific agencies, in fact, estimated a larger population of

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[2] Lower-skilled group in this study is defined as semiskilled and unskilled workers.

unskilled workers. For instance, the Construction Industry Development Board (CIDB) (2015) stated that 93 percent of foreign workers in the sector are general workers with little to no skills. In the agricultural sector, the Malayan Agricultural Producers Association (MAPA) estimated that foreign workers constitute 80 percent of the sector (ILMIA, 2016, in Hwok-Aun & Leng, 2018). Almost similar situations could also be observed in other sectors. Likely due to cost differentials and availability, most employers prefer to employ unskilled workers in manual jobs (Wei et al., 2018).

Table 1. 2: Share of foreign worker by skill

Skill	2010		2013		2016		2017	
	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment	% of total foreign workers	% of total employment
Skilled	7.3	2.7	4.5	2.7	3.9	2.1	4.7	2.7
Semiskilled	64.5	14.8	54.8	13.7	53.2	17	52.9	17.3
Unskilled	28.2	25.5	40.7	76.7	42.9	51.1	42.3	51

(Source: Department of Statistics, Labour Force Survey, various years)

The sectoral imbalance of foreign workers has attracted attention and expected to affect the unemployment rate of local workers. Employers' refusal to hire local workers in certain sectors gives a bad impression in job creation among local workers. A more transparent analysis is necessary by taking into account the characteristic of foreign workers entrance either they as a complement or substitutes to the local workers. The impact of the presence of foreign worker on the economy and the local labour market can be positive or negative. For example, the effect on local employment opportunities, it can be positive and negative depending on the skill of the foreign worker is a substitute or complement to local labour. Recruitment of suitable foreign worker necessary to reduce the unemployment rate of local people.

Figure 1.2 illustrates youth unemployment rate. The ten-year average of Malaysian youth unemployment is 11 percent. Their unemployment is often associated with labour market mismatch. The recent trend of job creation in the market is mostly for unskilled and semiskilled levels, while the supply of workers is largely high-skilled. Figure 1.3 below shows the share of working age population by educational attainment in 1990-2017. It can be seen that the labour force with tertiary education increased drastically from 20.29 percent in 2007 to 28.3 percent in 2017, a ten-year growth of 39.43 percent. Labour force with secondary education decreased over the same period.

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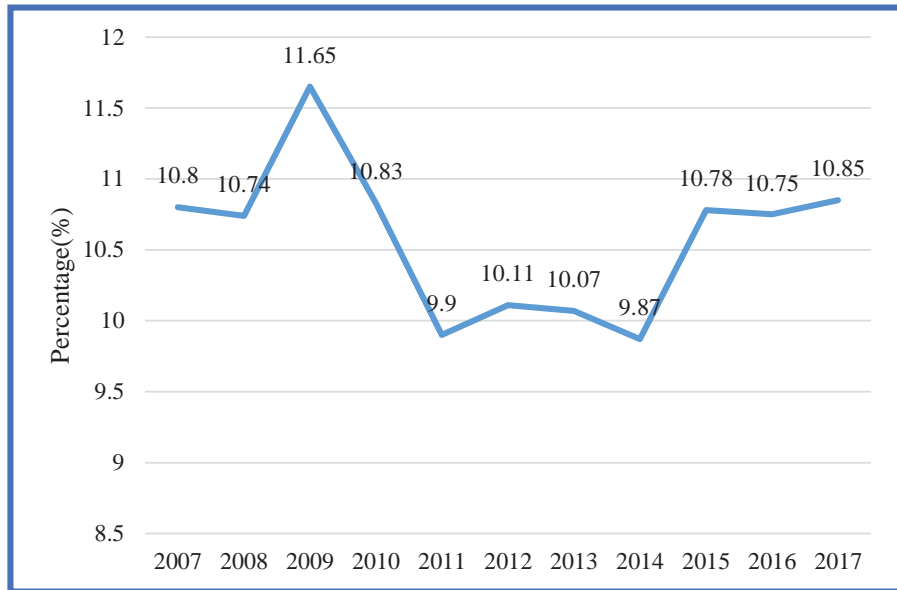
Figure 1. 2: Youth unemployment rate, 2007-2017
(Source: Malaysia, ILO, and World Bank Data)

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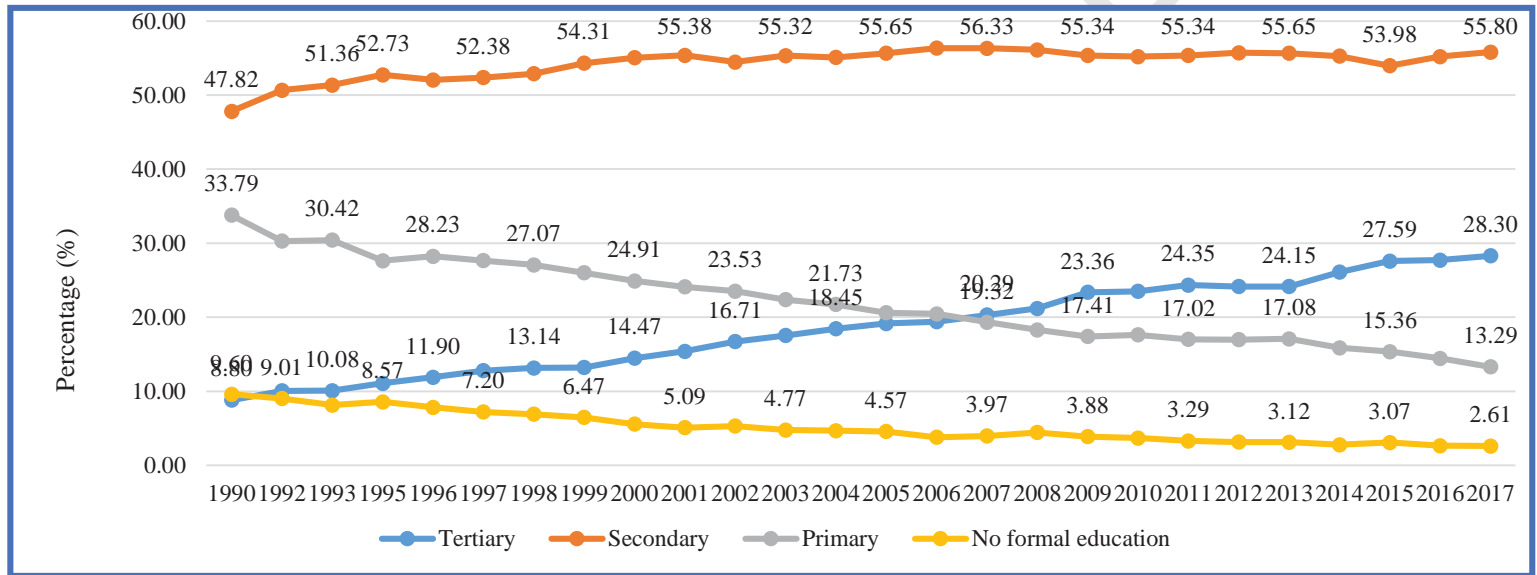
Figure 1. 3: Share of working age population by educational attainment, 2007-2017
(Source: Department of Statistics Malaysia (DOSM), Various Years
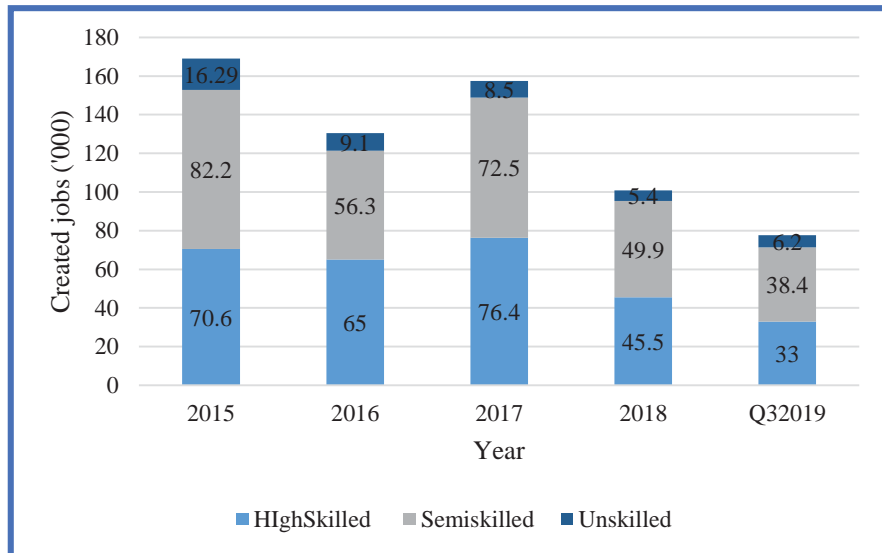
Figure 1. 4: Job creation by skill, 2015-Q32019
(Source: Department of Statistics, Employment Statistics, various years)

As can see in Figure 1.4, the job creation by skill has created more semiskilled and high-skilled jobs relative to unskilled occupations, but the year-on-year total has been declining. Q32019, 6.2 percent from the total job creation is unskilled job and more than half job creation is come from high-skilled and semiskilled job, which is 33 percent and 38.4 percent respectively. Similarly, recorded from ILMIA (2019), the market has created a total of 1.6 million jobs from 2012 to 2017, and almost half of them (48%) were for skilled workers. Semiskilled and unskilled workers, on the other hand, accounted for 38 and 15 percent of the created jobs. About three-fourths of the created jobs (1,220 thousand) were occupied by citizens. These suggest that local workers heavily benefit from these job creations, and the continuing dependence on unskilled foreign workers to occupied unskilled job still occurred. The increasing number of tertiary and secondary educated workers could as well encourage the use of capital goods due to the complementarity between skill and capital (Duffy, Papageorgiou, & Perez-Sebastian, 2004). Subsidies in capital investment could therefore induce the private sector to prefer skilled workers over unskilled foreign workers. This way, the demand for skilled workers and capital goods would simultaneously increase.

To reduce the dependence on foreign workers, the government has introduced several initiatives. The Economic Transformation Programme (ETP), introduced in 2010, aims to create 3.3 million jobs in 12 National Key Economic Areas[3] (NKEA) by 2020. The NKEA is expected to be driven by innovation and technology, and so the majority of the created jobs is targeted to be semiskilled and higher skilled, while

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[3] Oil, gas, and energy; palm oil; financial services; tourism; business services; electronics and electrical; wholesale and retail; education; health; information and communication technology; agriculture; greater Kuala Lumpur.

unskilled occupations are reduced (EPU, 2010). As of 2015, this policy has resulted in the creation of 501 thousand higher skilled, 1,130 thousand semi-skilled, and 320 thousand unskilled jobs. However, the program created fewer higher skilled jobs compared to the pre-ETP years (2006-2010), which saw the creation of 587 such jobs. Otherwise, it has been able to introduce more semiskilled and unskilled job compared to the pre-ETP years (Jun, 2016).

In the Eleventh Malaysia Plan (EMP), the government aims to increase labour productivity and move the country towards a knowledge- and innovation-based economy. This is expected to heavily employ semiskilled and higher skilled workers, as around 60 percent of the forecasted 1.5 million jobs created will require Technical and Vocational Education and Training (TVET) related skills. Additionally, greater automation is promoted in currently labour-intensive industries, such as construction and manufacturing (EPU, 2015). As of Q3/2019, the program has created more semiskilled and higher skilled jobs relative to unskilled occupations, but the year-on-year total has been declining.

In addition to the created jobs, the demand intensity for higher skilled and semiskilled labour has generally increased since 2011. The intensity of labour demand is a measure by which to infer aggregate labour demand. The increasing total working hours in a given sector may signal more intense labour demand and possibility of a labour shortage. In Figure 1.3, the classification of occupation is based on the Malaysia Standard Classification Occupation Codes (MASCO 2008)[4]. It shows that the net demand for all types of labour has intensified, most strikingly for Professionals (Code 2) and Services and Sales Workers (Code 5). In both cases, local workers are more likely to be employed, given that professional foreign workers are an insignificant number and the incomplete substitutability between local and foreign workers due to language barrier and knowledge of market (OECD/ILO, 2018). For example, as shown in Table 1.2 before, from the total foreign workers in 2017, only 4.7 percent work in professional jobs.

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[4] The job classification approach relied on the International Labour Organization's International Standard Classification of Occupations (ISCO-88) and Malaysia Occupational Standard Classification Codes (MASCO 2008). There are nine one-digit classes: Code 1 - Managers; Code 2 - Professionals; Code 3 - Technicians and Associate   Professionals; Code 4 - Clerical Support Workers; Code 5 - Service and Sales Workers; Code 6 - Skilled Agricultural, Forestry and Fishery Workers; Code 7- Craft and Related Trades Workers; Code 8 - Plant and Machine-operators and Assemblers; Code 9 - Elementary Occupations.
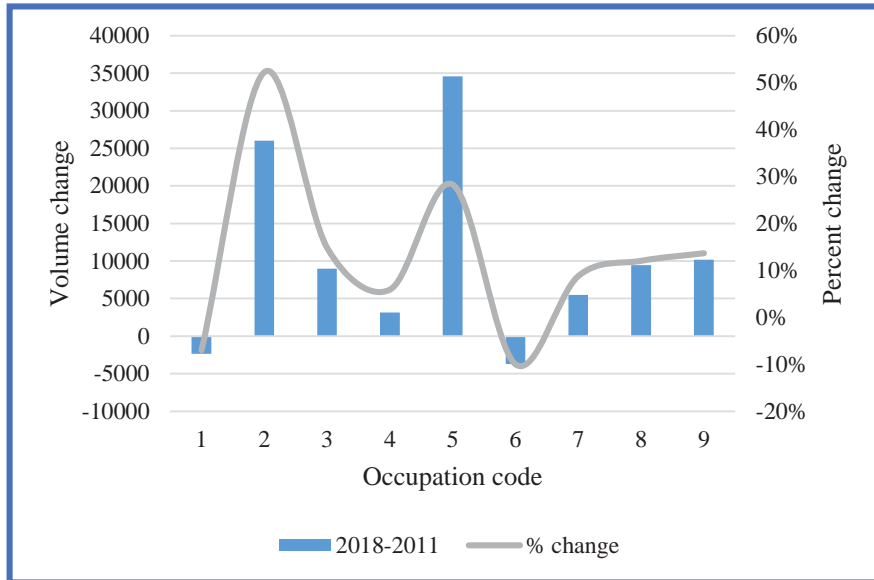
Note: 1-3: higher skilled; 4-8: semiskilled; 9: unskilled
Figure 1. 5: Change in intensity of labour demand
(Source: Department of Statistics, Labour Force Survey, 2012, 2019b)

The dependence on foreign workers has also contributed to the stagnating wages in the Malaysian labour market. This has also been augmented by the relatively lower labour productivity and technological advancement (BNM, 2019). As shown in Figure 1.5, the wages for unskilled workers have stagnated over the years, increasing partly due to the introduction of the national minimum wage in 2013. The compounded annual growth rate for the wages range between 3.7 and 8.9 percent. The lowest growth was for services and sales workers, while the highest for skilled agricultural, forestry, livestock, and fishery workers.
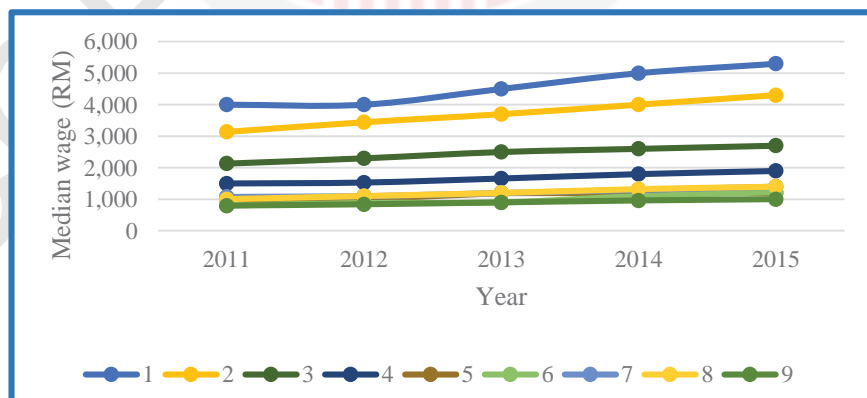
Note: 1-3: higher skilled; 4-8: semiskilled; 9: unskilled
Figure 1. 6: Median wage by occupation group, 2011-2015
(Source: Department of Statistics, Salaries and Wages Report, various years)

Despite the obvious difference in qualification, some semiskilled workers were compensated almost similarly to unskilled workers. In fact, in 2013, the wages of skilled agricultural workers (6) overlapped with elementary occupations (9) (Figure 1.6). Continuing to rely on unskilled foreign workers would see this trend to continue, and the wage inequality between skills would widen more. There appears to be a wide gap between the wages of the high-skilled and unskilled. This gap can be seen more clearly when the skills are grouped by sector (Figure 1.7). One standout outlier is mining, a capital-intensive sector that greatly values high-skilled workers.[5] Outside of that, in sectors where foreign workers are prevalent, such as manufacturing and construction, the gap between high-skilled and unskilled workers is wide: the average wage differences in the respective sectors are RM5,298 and RM5,532. The average monthly wages between unskilled and semiskilled workers in all four sectors are approximately level, especially in the construction sector, where the gap between these two skills is only RM121. This sector particularly recorded the highest share of foreign workers as a percentage of the total foreign workforce (Table 1.1).
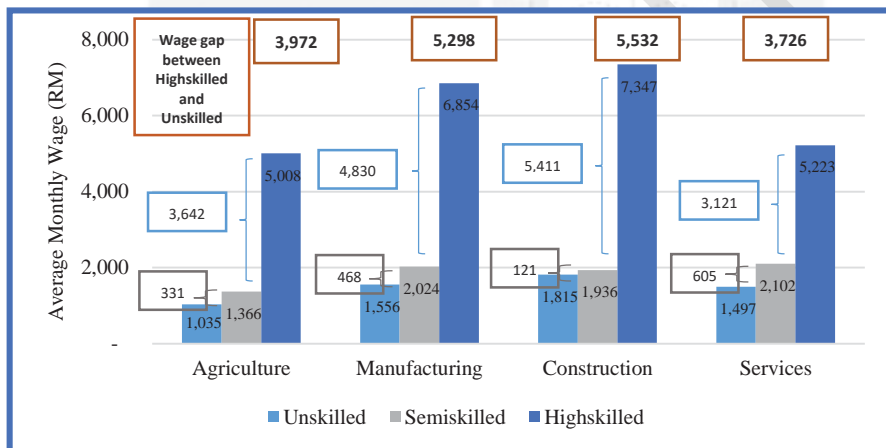
Figure 1. 7: Monthly wage by sector and skill, 2017
(Source: Department of Statistics (2019b))

As local workers are increasingly become educated and skilled, they would occupy more jobs in the higher skill sector. However, semiskilled local workers remain the highest category, and as such they may stand to lose from this persisting trend. In 2018, semi-skilled workers accounted for 61.1 percent of the local labour force, or 52 percent of the entire labour force. While foreign worker in the same skill category are considerably smaller, the number of unskilled ones are fairly substantial. As the wages are depressed further, semiskilled or unskilled local labour would be less inclined to occupy the jobs. Instead, they would be taken by foreign worker.

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[5] Mining is excluded from the graph as its inclusion trivialises the gap found in other sectors. In the sector, the mean wage for low-skilled workers is RM1,648, semi-skilled RM3,170, and high-skilled RM21,386.

Labour statistics suggest that most unemployed workers are secondary graduates (2018: 55%) rather than tertiary (2018: 35.4%), primary (2018: 6.3%), or uneducated (2018: 3.3%) individuals (DOS LFS, 2019). The reason for this may be threefold: (a) local workers are mostly semi-skilled, and so competition for jobs at this level is high; (b) mismatch (under/overqualification) in the labour market, such that tertiary graduates are taking semiskilled jobs (ILMIA, 2019); and (c) stagnation of wages below their reservation wages due to the incessant use of unskilled foreign workers (Figure 1.6 and Figure 1.7). In such a case, employers in the construction sector would prefer foreign workers due to their higher job-searching costs and lower reservation wages (Abdul Rahman et. al., 2012). Employment for semiskilled jobs is also a three-pronged competition between high-skilled, semiskilled, and unskilled workers. Mismatched salary expectations are the biggest hurdle for both Malaysian employers and overseas returnee talents (Jun, 2016). In general, most employers in the construction and agriculture sectors prefer foreign workers over locals due to lower costs of the former.

Nonetheless, the presence of foreign workers in the Malaysian economy remains necessary. Their employment in the early decades of economic development, especially during labour shortages, has enabled the country to stand tall over most of its ASEAN peers. Even now, they remain a necessity for certain sectors and occupations where there is no or little local supply. Similarly, most Malaysian researchers support the necessity of foreign worker, but they advise their proper regulation (Aziz, Ayob, & Abdul Somad, 2017). The government has also maintained this stance, as reflected in Malaysia Plan and the Construction Industry Transformation Programme (CITP), among others. Both recommend the proper management of foreign worker inflow and employment. Poor regulation would result in overdependence, much like the case in agriculture, specifically oil palm. As the number of Indonesian workers declined, preferring to work in their own country, the productivity of the industry has suffered (Ismail & Zin, 2003). It is thus necessary to carry out in-depth analyses to reveal appropriate measures in managing the foreign workforce.

Against this backdrop, this study attempts to answer the question by examining the impact of foreign workers on three different variables. *First*, on each sector of the economy. This reveals to what extent are the foreign workers able to create jobs in each sector. *Second*, on the labour demand. Specifically, the study assessed what would happen to the existing workers if there were an increase or decrease in foreign labour supply of varying skill levels. Would the incoming workers induce or reduce their demand? *Third*, on labour market outcomes, particularly wages and unemployment rate. This investigated whether foreign workers of certain skill levels depress or stimulate the wages of existing workers in similar or different skill categories, and whether the former would cause the latter to be unemployed.

The chapter presents the overview of the study. This section has discussed the background of the research. It is followed by the problem statement, research question, research objectives, and significance of study. At the end of the chapter, the organisation of the thesis is presented.

1.2 Problem Statement

While Malaysia's policy of importation of foreign workers has been effective in promoting growth and thrusting economic development in the short-run, it has permitted the gross recruitment of foreign workers, especially unskilled ones, by industry players. The government has acknowledged this issue in the New Economic Model (NEM) document. The movement of foreign workers into the country in the 1990s has supported the country's ascension from low- to middle-income. However, foreign worker policies following this period have been erratic and unsupportive of the current goal of becoming a high-income nation. Firms have been short-sighted, preferring short-term gains over long-term benefits. Unskilled foreign workers are hired liberally from neighbouring countries, causing their influx into the nation. It is thus necessary to introduce national policies that can moderate the use of foreign workers so as to realize Malaysia's long-term goals; yet, current policies are running to the contrary. Because of this prolonged practice, policymakers and policy influencers alike have argued that Malaysia will remain stuck in the middle-income economy trap for an extended period. Most popularly, the argument goes that the pervasive recruitment of foreign worker has caused slower growth, increased demand for unskilled labour, stagnant wages, and increased local unemployment.

This study is built on the back of three main intertwining issues that fuel the debates about foreign worker. Briefly, they go as follows. The persistent use of foreign worker (particularly unskilled ones), especially in the main economic sectors i.e. manufacturing, agriculture, construction, has resulted in little capital investment in the private sector, and as such the creation of unskilled jobs has grown relatively quicker than that of higher skilled and semiskilled, increasing the labour intensiveness of these sectors. This in turn has led to more demand for unskilled workers, as indicated by the high number of vacancies in unskilled jobs. As a result, there has been an influx of unskilled foreign workers, both legal and illegal. The estimation for illegal workers is between 1.9 to 4.6 million, and so their economic effects cannot be underestimated. Because of their essentially limitless supply, low bargaining power, and high migration costs, the wages of jobs that they occupy have remained low, forcing local workers with the same skill to move to another labour market (e.g. Singapore) in search of better wages. Their lower reservation wages may also cause the displacement of similarly skilled locals. Unskilled and semiskilled locals may be at risk of substitution as employers prefer lower labour costs. These issues are further expanded below.

Firstly, there is a hovering concern that firms substitute technological capital for unskilled foreign workers, allowing them to operate at much lower costs at the detriment of marginal productivity. As a result, productivity and output have stagnated, slowing economic growth. Malaysia has trailed behind other Asian countries whose economies are driven by innovation. Compared to China, Japan, or Korea, Malaysia's research and development expenditure is still lacking. This situation has lent to the overabundance of unskilled jobs, whose creation is growing faster than semiskilled or high-skilled jobs. The job market was still dominated by low-skilled jobs as of 2017, with 76.52 percent of job vacancies for unskilled positions, 11.78 percent for semiskilled, and only 4.70 percent for high-skilled jobs.

Similarly, compared to developed countries such as Singapore, the US, the UK, and Germany, Malaysia's industries are more labour intensive. Sectors that employ a large share of foreign worker, such as construction and manufacturing, are less capital intensive than the benchmark countries. As stated before, robot density in Malaysia's manufacturing sector was about 93 percent lower than that of Singapore, and around 50 percent lower than the Southeast Asian average. The preference for cheap labour over capital or technological investment has perpetuated the creation of low-skilled jobs. As pointed out by evidences in some developed countries, areas or sectors with a substantial number of low-skilled workers will create more low-skilled jobs. In turn, these jobs attract low-skilled foreign workers, and so the cycle continues. Unless specific interventions are introduced, slow productivity growth and industrial modernisation will persist.

While foreign workers do create new jobs, the skill requirements of these jobs may not suit the existing workforce. As most foreign workers in these sectors are unskilled, it is likely that they create more unskilled jobs relative to higher-skilled ones. The creation of these jobs is not beneficial for Malaysia's current workforce, who are mostly educated at the secondary and tertiary levels. In fact, the current labour market is sending signals of mismatch, as the number of available higher skilled jobs are lower than the number of higher skilled workers, especially tertiary graduates. Therefore, there is a necessity to analyse which subsectors benefit from the employment of foreign worker. Put another way, in which subsectors do foreign workers contribute the most jobs? Which sector should maintain foreign workers, and which should forego? Which workers in which sector benefit from, or suffers due to, foreign workers? The answer to this question will help policymakers to determine where to limit recruitment of foreign workers, especially low skilled ones. Where a subsector is imposed strict regulations to hire foreign workers, incentives for capital investment and technology adoption can be introduced.

Secondly, the increasing demand for foreign worker causes concerns that they may adversely affect demand for local labours, especially those with similar skills. This issue continues the previous one. If the cost of labour is a major consideration for the preference for foreign workers, it means that employers invest little in capital goods. This opens up more work for (especially low-skilled) foreign workers, who in turn create more jobs for similar workers. Ensuing from this sequence is the increasing demand for these workers increase, as seen from the rising share of vacancies for unskilled occupations in recent years. Because of the firms' low capital investment and implementation, higher skilled workers are unable to find jobs relevant to their qualifications; instead, they must suffice themselves to work, overqualified, in semi-skilled tasks. These workers, and the market in general, lose out due to the lack of technological spillovers that could have been found in the market had employers recruit higher skilled foreign workers. Instead, the persistence to hire low skilled foreign workers has reduced capital investment, leading the sectors to become more labour-intensive. So long as employers do not invest more in capital and technology, foreign workers will remain the solution to fill these vacancies. Additionally, this suggests the relation between unskilled and semiskilled and higher skilled workers: the prevalent employment of the first would cause demand for the latter two to decrease. All this does not take into account undocumented workers, whose economic effects are not marginal.

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From here, it is therefore an important question to determine where to restrict or allow foreign worker to intensify their complementarity effects. In certain sectors, restricting the employment of low-skilled foreign workers can encourage capital investment. For example, in agriculture, the demand for these workers has constantly been high, and as such the firms invest little by way of capital. Incentivising capital investment while limiting foreign workers may thus open more jobs for semiskilled and higher skilled locals. It is important to note that this effect does not apply only for unskilled workers, and so it is necessary to analyse the effect of the inflow of foreign workers of all skill types on the demand for existing labour of varying skills. This will allow policymakers to identify areas where the skill-capital complementarity can be maximised.

Thirdly, there is a persisting concern that foreign workers can depress wages and increase unemployment of locals. It follows the scenarios laid out by the previous two issues. As desire to lower labour costs endure, more low-skilled foreign workers are recruited. Capital investment slows down, while demand for these workers rise. These workers are theoretically unlimited in supply. They also have low bargaining power and reservation wages, and as such they appear to stagnate wages for certain occupations (Table 1.7) and among low-skilled jobs. Local workers with similar skills thus would be displaced, moving to other labour markets that match their preservation wages.

Semi-skilled workers may also be substituted by the other two groups. unskilled workers may displace them as a cheaper solution, and higher skilled labour may occupy their jobs due to mismatch. Undeniably, low-skilled foreign workers may be complementary for semi-skilled locals, creating supervisory jobs or even leading to the establishment of new firms such as insurance agencies. However, this solves neither the slow productivity growth, lack of capital investment, nor the lack of higher skilled jobs. Therefore, it is necessary to assess in detail the effects of foreign workers in each skill group on the wages and unemployment rate of existing workers. Which skill types of foreign workers will affect the level of wages and unemployment rate? What is the appropriate share of foreign workers in the labour market? This will allow policymakers to identify where to limit or encourage foreign worker inflow (of varying skills) so as to correct wages and reduce unemployment.

1.3   Research Questions

Based on the research objectives of this study, the research questions are listed as follows:
1. Which subsectors do foreign workers contribute the most jobs to?
2. Which sectors should maintain foreign workers, and which should forego them?
3. Which workers in which sector benefit from, or suffer due to, foreign workers?
4. Which skill types of foreign workers should be restricted or allowed to intensify their complementarity effects?

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5. Which skill types of foreign workers will affect the level of wages and unemployment rate?
6. What is the appropriate share of foreign workers in the labour market?

1.4 Objectives

The general objective of this study is to address the effects of foreign workers on the economic sectors and labour market of Malaysia. Its specific objectives are as follows:

1. To analyse the sectoral effect of foreign workers.
2. To investigate the impact of foreign workers by skill levels.
3. To investigate the impact of foreign worker on labour market outcome.

1.5 Significance of the Study

The study contributes to the literature and policymakers. The contribution to the literature may be detailed as follows. *First*, prior empirical studies are mostly based on inconsistent data. Certainly, this is by no fault of the studies themselves but of the inherent design flaws of national labour force surveys, causing the under-recording of foreign worker (Del Carpio et al., 2015; World Bank, 2015; KRI, 2018a). It nonetheless remains an important critique of existing research because estimations of foreign worker, either aggregate or sectoral, may differ by large margins across different statistics, influencing the results of the research.

Second, the methodological contribution of the study comes from the construction of a new dataset that allows for a more correct representation of foreign worker in the Malaysian labour market. Empirical studies in Malaysia have been hampered by inconsistent foreign worker's data.[6] For instance, the Labour Force Survey (LFS) covers only households, but not communal housings, which are residences of foreign worker, especially those in the agricultural sector. This causes the under-reporting of foreign worker in the LFS. The National Employment Returns (NER) circumvents LFS shortcoming by directly inquiring firms of their employment activities; however, there is a possibility of a downwards bias in the responses. Firms, especially those employing illegal foreign workers, would not be too inclined to report their employment.

Another data source is the work permits issued by the Ministry of Home Affairs (MOHA), which may be the most accurate data possible, as it captures the entire population, not the sample, of foreign workers. However, it only records documented workers. Additionally, the sectoral or occupational distribution of the registered worker may not reflect reality. In some cases, foreign workers have been issued a permit to work in a given sector, but they then move to another sector to work. Other databases include estimates by industrial agencies, though most of the

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[6] Loh et al. (2019) offers a comprehensive discussion on this topic.

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times these cannot be corroborated by other surveys. For instance, MAPA approximates that 80 percent of the labour force in the agricultural sector are foreign workers, but the estimates from LFS and NER are far from this figure. The 2018 LFS reports the share to be 31 percent, while the 2016 NER 66.3 percent. The final outcome of this conundrum is the failure to capture, with reasonable accuracy, the effect of foreign workers on Malaysia's labour market.

Third, the findings of those empirical studies lack breadth and depth, since they highlight only the impact of foreign workers on certain sectors or skill groups. To circumvent this issue, this study constructed a new social accounting matrix (SAM) model using the 2010 Malaysia National Account (MNA) and 2010 Input-Output Table. SAM was used because it is a "comprehensive, disaggregated, consistent and complete data system that captures the interdependence that exists within a socioeconomic system" (Decaluwé et al., 1999). Its comprehensiveness records all transactions within the national economy and between it and the rest of the world; these transactions can be disaggregated, theoretically, up to the smallest possible level; its consistency commands balance between the receipts and expenditures of each economic actor, applying the double-entry principle; and its completeness captures all incomes and outlays in the economy. These advantages allow for a more accurate representation of foreign worker because it accounts for their consumption activities and remittances. The outcome from this exercise is thus more relevant and accurate policy implications.

Additionally, the impacts of foreign workers on labour demand and labour market outcomes were analysed using the CGE-Malaysia Foreign Labour (CGE-MAFLA) framework, an extension of the International Food Research Policy (IFPRI) CGE model. In the CGE-MAFLA model, labour was disaggregated into four skill levels and the sectors into 12 industries. It also employed a four-level nested constant elasticity of substitution (CES) production function, which estimated the substitution relationship not only between capital and labour but also between and within the higher-skilled and the lower-skilled labour. The modelling assumption also differed from the orthodox CGE model, as it assumed an imperfect labour market to account for the effects of unemployment. In previous studies, CGE was only used to model the effects of low-skilled foreign worker inflow and levy hikes on macroeconomic and labour market indicators (Kanapathy, 2011; World Bank, 2013). The CGE modelling framework was preferred as it is able to quantify the extent to which foreign worker inflows impact the economy and labour market, mainly because it provides a framework that accounts for general equilibrium effects and key channels linking the macro and micro effects of a policy shock. In simpler terms, it allows the estimation of the effect of changes in one part of the economy on the other parts. By applying CGE, the study offers both breadth and depth with regards to the sectoral impact of foreign workers on the economy and labour market.

The study also arrives at a number of important policy implications, which should add to the evidences and insights for the current debate on immigration. First, quality data on foreign workers are urgently needed to obtain a better understanding of the issue. The government thus should make considerable effort to improve

migration statistics and facilitate comprehensive researches and assessments on the scale, characteristics, and impacts of immigration. Second, the Malaysian government should prioritise the entry of higher-skilled foreign workers into the labour market. The CGE-MAFLA model showed that higher-skilled labour could create larger benefits than lower-skilled labour in the primary sector and in some tertiary sectors. Third, the policy implication is clear: if the government's primary objective is to decrease the unemployment rate, the appropriate policy is to encourage the inflow of highly skilled labour. Of all foreign worker skill groups, only the highly-skilled group is helpful in reducing the total unemployment rate, most likely by creating jobs for the semi-skilled and unskilled labour force.

1.6   Organization of the Study

This study is organized as follows. The next chapter presents the theoretical framework for the subjects of this study. Specifically, chapter 2 starts with a discussion on the reviews previous empirical work related to the impact of foreign worker inflow on receiving countries, the ways in which the inflow is expected to affect the labour market, and the strength of the evidence supporting these expectations. Following that, the chapter discusses several theoretical and empirical knowledge on the economic impact of foreign worker inflow to developing countries. foreign worker The last part of the chapter provides a discussion on the application of CGE analytical framework on the impact of foreign worker inflows.

In chapter 3, explaining the data and their sources that are utilized in this study, a detailed explanation of the methods chosen to accomplish the objectives one. The chapter starts with a description of the method Social Accounting Matrix (SAM). The second part of chapter 3 presents the procedures of building an SAM.   The third part of this chapter discusses the SAM multiplier model and the procedure to calculate the employment multiplier. The last part present the compilation of data used in employment satellite account and brief the step in developed the satellite account.

Chapter 4 to explaining the CGE-MAFLA model and the extended CGE-MAFLA model. Firstly, this chapter presents a mechanism of the CGE model, as well as its procedures and structures. Afterwards, presents the data sources and data compilation. The next part, this chapter identifies the behavioural relationships among Malaysian agents. These are defined by referencing to the submatrices of the SAM within which the associated transactions are recorded. Following that introduces an algebraic statement of the CGE-MAFLA model in five groups. The last part of the chapter provides a discussion macroeconomic closure and the important elasticities for the model by reviewing the existing literature.

Results and discussion of the findings are presented in Chapter 5. This chapter starts with a presentation of the results of the SAM-multiplier analysis to assess the sectoral impact of foreign worker. The distinct impacts from foreign worker possessing each of the four skill levels, namely highly skilled, skilled, semiskilled, and unskilled, are thoroughly presented and discussed. Afterwards, the discussion

concentrates on the results and findings from the effect of foreign worker inflow on wage and unemployment is deliberated. In the last part, this chapter provides the results and analysis of the consistency tests of the entire CGE-MAFLA model.

Chapter 6 provides the conclusion of the study and some recommendations and policy considerations that can be put forward to the future research. This chapter concludes with some proposals for future research.

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