THE UNSKILLED LABOR DEMAND IN ACROSS ECONOMIC SECTORS IN MALAYSIA: PANEL ANALYSIS

MUHAMMAD ZAKIR BIN ABDULLAH

MASTER OF ECONOMICS

UNIVERSITI UTARA MALAYSIA

2014

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BY

MUHAMMAD ZAKIR BIN ABDULLAH

Dissertation submitted to Research and Post Graduate Study, Othman Yeop Abdullah Graduate School of Business in fulfilment of the requirement for the Master Degree of Economics, Universiti Utara Malaysia.

January 2014

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ACKNOWLEDGEMENT

I would like to give substantial thank to Allah for blessing me and letting me to complete this degree's research paper. Finally, it is successfully done although there are much kind of adversity and problem. I also would like to give my special thanks to Dr. Husin Abdullah, Senior Lecturer at College of Business, University of Utara Malaysia, as my supervisor. He has assisted me much such as giving his idea, guiding me and supervising me along this research was done.

The great appreciation goes to my beloved family. They have given endless encouragement to me to finish this project.

Thousand thanks to my unforgettable friends for helping me to complete this project. Particular appreciation goes to Mohd. Ammar Hafizi B. Azham, Muhammad Nizam B. Abdul Bakar, Muhammad Nasir B. Abu Bakar, Nor Hamida Bt. Md. Shafi and Muhamad Sobri B Karim, Auwal Tilde B Yahya and others are not mention here. They are very supportive.

ABSTRACT

This study is to examine the unskilled labor demand across the major sectors in Malaysia. By using panel data analysis on unskilled labor demand model, the responsiveness how unskilled labor employment on its determinants can be determined in long run. This research employs 13 years of secondary data form 2000 to 2012 across the Malaysian manufacturing, agriculture and services sectors. The finding suggests there is less responsiveness of wage and productivity on unskilled labor demand in these three sectors. The capital cost is very responsive on unskilled labor employment in Agriculture. The imported input cost and foreign labor employment is less sensitive with unskilled labor employment in agriculture. However, there is no evidence the impact of capital cost, imported input cost and foreign labor on unskilled labor employment.

Keyword: Nominal Wage Unskilled labor, Unskilled labor Employment, Panel Data Analysis.

ABSTRAK

Kajian ini menguji pasaran buruh tak mahir di sektor-sektor di Malaysia. Dengan menggunakan terhadap analisis panel data, model permintaan buruh tak mahir, tindak balas buruh kurang mahir terhadap faktor-faktornya dapat deikenalpasti dalam jangka masa panjang. Kajian ini menggunakan 13 tahun data secondari daripada tahun 2000 hingga 2012 di sektor pembuatan, pertanian dan pekhidmatan. Dapatan kajian mendapati upah dan productiviti adalah kurang bertindakbalas dengan permintaan buruh tak mahir di ketiga-tiga sektor ini. Kos modal adalah sangat bertindakbalas dengan buruh kurang mahir di sektor pertanian. Kos input yang diimport dan buruh asing adalah kurang sensitive dengan buruh kurang mahir di sektor pertaninan. Tetapi tiada bukti yang menunjukkan kesan kos modal, kos input yang diimport and buruh asing terhadap guna tenaga buruh kurang mahir di sektor pembuatan dan perkhidmatan.

Keyword: Upah Nominal Buruh Tidak Mahir, Guna tenaga buruh tak Mahir, Analasis Panel data.

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LIST OF ABBREVIATION

Bank Negara Malaysia	BNM
Ordinary Least Square	OLS
Fully Modified OLS	FMOLS
Skilled Bias Technology Change	SBTC
Shift-Share Analysis	SSA
Information and Communication Technology	ICT
Information Technology	IT
Total Factor Productivity	TFP
Augmented Dickey Fuller	ADF
Levin, Lin & Chu	LLC
Im, Pesaran & Shin	IPS
Balance of Payment	BOP

CHAPTER 1

INTRODUCTION

1.1 Introduction

Unskilled labor can be defined as a less –trained, less- experienced and low-educated labor in a labor market. Previous work have been classified unskilled labor demand in many ways such as Bhulaor & Kripornsak (2008) defined unskilled labor by occupation, Sayre (2001) defined unskilled labor by education, Rusmawati & Asmaddy defined unskilled labor by income earned and Rich (2011) indirectly defined unskilled labor as a production labor.

Unskilled labor employment seems to decrease over the last two decade due economic structural changing and globalisation processes. The factors from demand side (such as Skilled Bias Technological Change (SBTC), international trade (Bhulaor & Kripornsak, 2008) and underpaid wage) and supply side (such as skill-training institute, foreign migration, government policy and institutional force) can explain the trend of unskilled labor employment.

The unskilled employment is likely to change over the Malaysian business cycle and economic structural change. Starting from 1977, there were more unskilled labor was employed in Agriculture sector like estate and forestry due to rapidly increasing of lumber and rubber price (Economics Report 1977/1978) even the economic growth was very slow. The unskilled labor employment tended to shift to manufacturing sector in 1984 where industrialization activities were greatly increased and led to create more labor demand growth at 4.3 percent. However, the construction sector was recorded as the highest labor demand growth (6.9 percent) where this sector

suffered from the lack of unskilled labor employment. In Agriculture sector, the growth of unskilled employment drastically became slower at 1 percent due to migration of unskilled labor to city and industry areas (Economics Report 1984/1985).

The labor employment gradually grew due to slower economic activities in 1988 and become faster after the economic recovery in 1989 which created a huge growth demand for unskilled labor. In manufacturing sector, 16.4 percent of unskilled labor employment was created by the factor of higher demand on rubber and steel based. The agriculture still recorded the lowest labor employed at 1.3 percent which many labor likely to migrate from rural areas to cities. Services sector like retail, hotel and restaurant also likely to hire more unskilled labor and foreign labor (Economics Report 1988/1989).

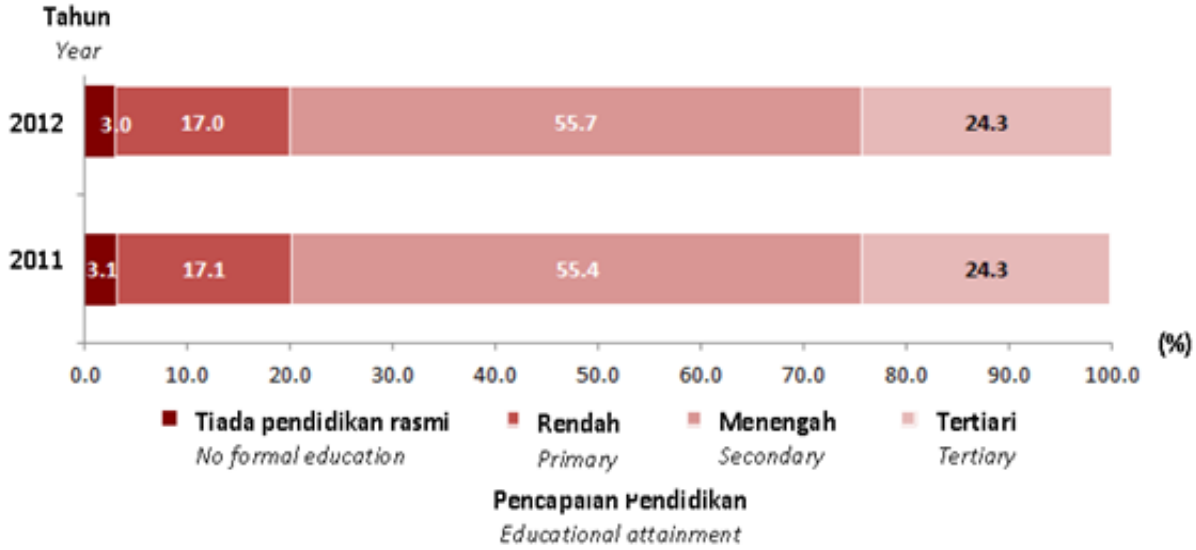
In 1998, unskilled labor was suffering from their job losses and many foreign labors were sent back to their own countries due to economic recession. The construction and agriculture was recorded negative 13 percent and 6 percent respectively (Economics Report 1998/1999). After the recovery, Malaysian economic started to generate a huge number of labor demand where the manufacturing created the highest vacancies where 2.45 million new jobs were offered in 2001. At the same time, government policy more concerned on skill- labor enhancement by establishing more skill institute where about 46.4 percent of skilled labor is produced (Economics Report 2000/2001) in labor market. It meant that government seriously tried to reduce number of unskilled worker in order to increase national productivity. To become high- income nation, government attempted to implement policies that enhance productivity that can absorb labor cost due to increase of nominal wage.

There was more educated labor entering the labor market in 2005 where there was about 17.5 growth of labor with tertiary- education level participation. However, the participation of labor with secondary- education level (about 50 percent growth) was far greater than tertiary –level educated labor (Economics Report 2004/2005).

The strong economic activities encouraged the employment for skilled and unskilled labor to grow faster where more labor demand was created by services sector at 51.5 percent growth. This indicated that the labor employment was shifted from manufacturing to services sector in 2007 (Economics Report 2007/2008).

Towards 2012, services sector created more labor demand at 35.7 percent growth compared with 32.7 percent growth in manufacturing. The growth of foreign labor was dropped by 4.5 percent. Skill training Institutes such as IKM, IKBN, GIAT MARA and ILP also help to create more skilled labor to support the skilled labor demand (Economics Report 2011/2012).

Chart 1.1: Percentage distribution of employed persons by educational attainment, Malaysia 2011 and 2012



Source: Malaysian Department of Statistic, 2012

The Chart 1.0 shows the labor with secondary education attainment and labor with tertiary education attainment are 55.7 percent and 24.3 percent respectively from the total employment. This means that labor with secondary education attainment dominating Malaysia labor market.

Table 1.1: The Percentage of Skilled Labor and Unskilled Labor to Total Employment.

Year	Percentage of skilled Labor (%)	Percentage of unskilled labor (%)
2011	56.23	43.77
2006	51.27	48.73
2001	47.66	52.34
1996	46.68	53.32
1991	42.97	57.03
1986	42.7	57.3

Source: Malaysian Department of Statistic, 2012

The unskilled labor employment was greater than the skilled labor employment from 1986 until 2001. The skilled labor was exceeding unskilled labor employment starting from 2001. There are more educated labors were produced via skills institute, vocational school and college and led to increase of skilled labor employment rather than unskilled labor employment.

1.2 Issues of Unskilled labor Employment

The major issue of unskilled labor that have been raised was the lack of unskilled labor employment especially in Malaysian palm oil and hotel and restaurant sectors.

Foreign labor was blamed for causing the underpaid wage payment to local unskilled labor and hampering the Malaysian's aspiration to become a high-income nation. Thus, government tries to limit foreign labor by rejecting many applications in hiring foreign labor especially from India. As a result, restaurant sector which employed foreign labor from India is suffering from the lack of unskilled labor (BBC News, 2011). The expectation that "the job should goes to local labor" cannot be reality since Malaysians do not want the job (because of long working hours and low wage payment).

The minimum wage implementation by Indonesia seems to attract Indonesian workers in Malaysian Palm oil and Rubber sector to go back to their country. This policy is expected to cut about 60000 workers in Palm oil and Rubber sector (The Malaysian Insider, 2013). The unskilled labor availability crisis causes to producers to rely on machines but the production of palm oil is expected to fall. In addition, the poor combination of unskilled labor with capital employment explained why the palm oil sector was suffering from productivity losses at -11.2 percent in 2012 and the declining of domestic and external demand from RM83.3 million; 2011 to RM73.3 million; 2012 (Productivity Report 2012/2013)

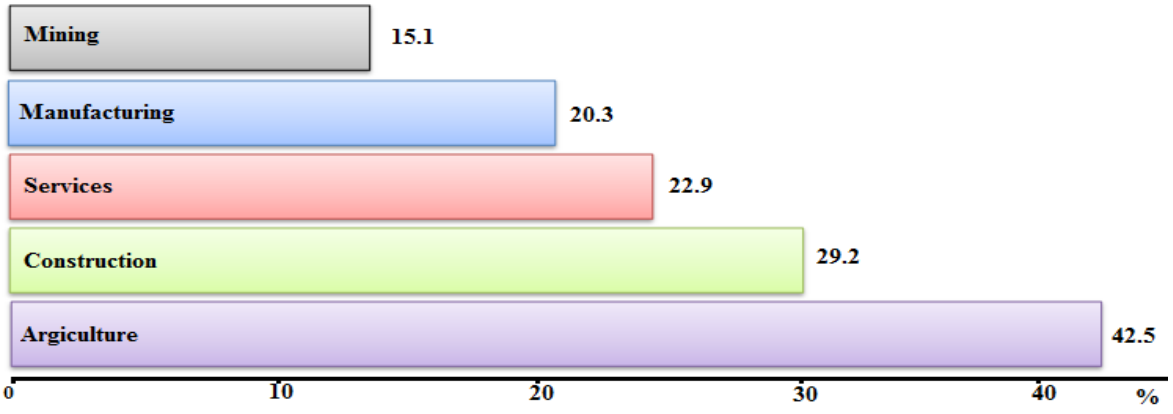
The capital employment which may create job destruction for unskilled labor is an important unskilled labor employment issue. Many producers attempt to reduce their dependence on labor employment and employ more capitals (machinery) and technology since labor cost is increasing each year. The Malaysian manufacturing sector managed to overcome labor (unskilled labor and skilled labor) shortage by switching to labor-saving equipment and technology in production and produce 0.25 percent of employment growth in 2012 (Productivity Report 2012/2013).

Another issue of unskilled labor is the productivity problem where Malaysian workers (unskilled and skilled labor) experienced lack of performance culture where they likely to spend half of working hour to do unrelated matter with their task (The Star, 2013). Unproductivity works like cigarette break, surfing internet, shirk during work and office chatter drained away working time and reduced the productivity level. This matter should look seriously because it will drive away investor to neighbour country.

1.3 Problem Statement

Even the unskilled the growth of labor employment is accompanied by the increasing of skilled labor employment, the certain sectors (such as estate and forestry, hotel, retail and restaurant) is still suffering from the lack of unskilled labor employment. This is because of the percentage of unskilled labor distribution is vary across Malaysian sectors. The following chart shows the dependency of Malaysians sector on unskilled labor employment:

Chart 1.2: Share of unskilled labor from the total employment by Malaysian sectors.



Source: Bank Negara Malaysia, 2012
Note: This chart shows the share of workers that earned the minimum wage setting. This chart directly shows the dependency of unskilled labor across Malaysians sectors.

The Chart 1.1 shows the Malaysian agriculture sectors, construction and services are the highest unskilled labor employment where 42.5, 29.2 and 20.3 percent from total sector employment respectively. It means that these sectors are the most affected from any unskilled labor employments change if its determinants (such as wage, capital employment and etc.) are changing. These determinants of unskilled labor are responsible for driving the trend of unskilled demand overtime and also cause the unskilled labor shortage in a sector (such as foreign labor employment). The elasticity of unskilled labor employment with respect to its determinants seems very useful to imply shows the responsiveness of unskilled labor employment with respect to its determinant.

The changing pattern of unskilled labor seems to move inconsistently over four decade due to the changing of Malaysian economic environment. Thus, how unskilled labor employment reacts with its determinants should be explained dynamically to show the long run and short run behaviour of Malaysian unskilled labor demand.

1.4 The Objective

1.4.1 General Objective.

The purpose of this study is to examine the unskilled labor demand by using the panel data analysis.

1.4.2 Specific Objective.

The specific objectives in this study are:

1. To examine the long run relationship between unskilled labor demand with nominal wage paid to unskilled labor, interest rate, exchange rate, foreign labor employment.
2. To analyze the responsiveness of unskilled labor demand with each of its determinants by sectors.

1.5 Organization of Study.

This section is explaining the outline of the organization of this study. The Chapter 2 will discuss the literature that related with labor market at the different case study. Chapter 3 will show the data and methodology that will be employed in this study. The Chapter 4 explains the finding of this study. The Chapter 5 discusses the finding and concludes this study by answering the objectives of this study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section consists of three parts where the first part discusses the market structures and their findings. This part is very important to describe the type of labor market and can be a backbone to build labor demand model in this study. The second part explains the unskilled labor demand and its determinants. This part gives suggestion about the determinants of unskilled labor demand. The last part explains the employment, wage and productivity relationship.

2.2 Market Structure

2.2.1 Wage Rigidity

A labor market in one nation is built together with two main objectives which are; to maintain the sustainability of employment and to maintain the labor cost in competitive international market. According to Sohail (2012), to achieve these objectives, a flexible labor market needs to build. However, the wages rigidity such collective bargaining process that lead to wide wages deferential and large salary range always reduce the flexibility of one labor market. If wages not flexible at competitive international market, the tools for lowering labor cost are fail to increase the productivity rate or depreciate exchange rate. Instead, the wages level which flexible at competitive international market is resulting the productivity growth and maintaining labor cost at competitive market. In reality, the wages market rate is generated from the downward wages rigidity and lead for firm to cut employment

rather than wages. Sohail's (2012) study provides an explanation why wages growth rate unable to catch up with productivity growth rate for Malaysia's case.

Using a simple efficiency Wages Model, Carter (2005) assumed the presence of wages rigidity in short run was due to coordination problem (as suggest by Stiglitz, 1986 and Summer 1988) and long term contracts (as suggest by Gottfries and Westermark 1998). But in the long run, the labor market is perfectly flexible. Carter's (2005) study indicated that the perfectly flexible labor market in long run was appropriate with Neoclassical assumption.

Iancu & Popescu (2011) investigated the negative impacts from labor regulation, role, risk and benefit of labor regulation over labor market. The study suggested that the employment contract limits labor market flexibility. Iancu & Popescu (2011) echoed Kaufman (2007) that labor market are inherently and imperfect due to of human being characteristic. Thus, neoclassical labor of perfect competitive labor market assumption look like a good rhetoric but seems impossible to occur in reality. If labor market perfectly competitive, labor demand is well defined in downward sloping condition and wages rate and employment are becoming stable. The flexibility of labor market was translated into degree to which employment and wages adjusted according to economy changes. Contrary to Carter's (2012) said that perfectly labor market exist in Long Run, Iancu & Popescu (2011) argued that perfectly labor market does not exist even in the long run.

Tang (2012) employed gravity model to figure out how does labor market protection motivates labor to acquire firm-specific skills relative to general skills. Consumption function and labor indirect utility were derived by adopting into gravity model. Demand for factor (labor) for sector was treated as dependent variable and consumption was treated as independent variable. For labor indirect utility, wages,

level of effort (productivity) and marginal disutility effort were acted as dependent variables and utility treated as dependent variable. Bargaining power showed the degree of labor protection where more protective labor law was creating more relationship with employers and motivated labor to acquire firm-specific skilled relatively to general skills at 99 percent level of significant. Tang (2012) explained the concept of Collective Relation as an index for unweighted average of union power and collective disputes that ranged from zero to one. In other words, the Collective Relation can be considered as the degree of labor market flexibility. More Collective Relation means that more stringent labor law and reduces the labor market flexibility and vice versa. Kazakhstan (1.000) and Portugal (0.985) suggested as the most stringent labor law and Nigeria (0.023) and Malaysia (0.000) are the less stringent labor law. Thus, Malaysia can be considered as nearly flexible labor market. Unlike Felbermayr, Larch & Lechtahler (2012) who stated wage rigidity was determined by lower productivity, Tang (2012) more prefer stringent law as a determinant of wage rigidity.

Kaufman (2008) argued the perfectly competitive market is impossible to exist. This is because of wages which have large element of rigidity and cannot re-adjust to the equilibrium labor. However no empirical evidence showed in this study. Institutionalist accepted the view of the long run labor market that involved different type of labor variables and in the short run the imperfect “human element” involved in labor market. Thus, Institutionalist, used this view to argue with perfect competitive market assumption. This study yielded four theorem of labor market 1) labor market always imperfect, 2)wages rates are bargaining and administrated 3) in non-labor market, the wage rates always to be tipped in favour of employers and 4) wage rates is unable to self-regulate to attain full employment. Even the Kaufman

(2008) argument on labor market look more realistic than perfectly competitive labor market assumption, but it seem hard to measure employment since imperfect element of human characteristic associated in labor market.

2.2.2 Union Coordination in Wage Setting

Dority (2007) replicated the finding of Layard, Nickel and Jackman, LNJ in their well-known book. LNJ have characterized the labor market into unemployment which functions with (1) duration of unemployment benefit, (2) replacement ratio (3) inflation, (4) active labor market program (5) degree of union coordination in wages setting, (6) degree of employer coordination in wages setting and (7) union coverage. Then, Dority (2007) associated the LNJ's function with some additional variable; (1) global competitiveness and (2) openness to immigration. The finding suggested that unemployment is continuously affected the labor market. In other finding, the coordination by union and employers in wages- setting process help to overcome unemployment. However, the union coverage (how many percent labor was covered by the union) contract still causing unemployment. In brief, the factors of labor union and employers play important role to influence employment in labor market according to Dority (2007).

Felbermayr, Larch & Lechtahler (2012) who connected open economy and unemployment setting in their study assumed that wages rate are bargained before production take place and each labor employed according to Marginal labor. The state of over-hiring externality means that if firms willing to hire more labor than socially optimal, the contribution marginal labor are depressed and lowering labor bargaining power. In other words, more labor hiring lead to reduce labor power in bargaining. Felbermayr, Larch & Lechtahler's (2012) analysis related the

productivity rate seems to fall down when more labor are employed and then give some rigidity on wages rate to change. This study supported the Sohail's (2012) suggestion on wage rigidity through collective bargaining process.

2.2.3 Employment and Wage Elasticity.

Kon (2012) was studying the market labor equilibrium to define determinants of labor elasticity or labor intensity (employment divided by Gross Domestic Product, GDP) by deriving labor demand and supply. Theoretically, the study shown that the employment elasticity get larger if labor supply become more wage-elastic and labor demand less- wage elastic. There are three factors that alter the employment elasticity. First, the change in wages elastic of labor supply. As income increase due to economic growth, the income effect on wages tends to decrease the wages elasticity of labor supply (inelastic labor supply) and then, employment elasticity also decrease. The second factor is the change in wage elastic of labor demand; in manufacturing sector, there is more wages-elastic of labor demand compared to services sector. Moreover, in services sector, increasing of the ratio of labor cost out of total cost leads to increasing the elasticity of labor demand. Thirdly, change in output elasticity of labor demand. Kon's (2012) study provides a new analysis of the Neoclassical labor market by looking at elasticity of labor demand and supply jointly.

Bergin & Kearney (2007) were studying on highly elasticity of labor supply in Ireland through migration by estimating small structural model of Irish labor market. Finding said that skilled labor wage elasticity is higher than unskilled labor wage elasticity due to higher degree of openness. By means of human capital accumulation, the labor supply of skilled labor is higher relatively with skilled labor.

Adding with the effect of increasing of international competitiveness regarding to the higher degree of openness, the skilled labor wages is falling and narrowing the wages gaps between skilled and unskilled labor. The Constant Elasticity Substitution, CES derived the labor demand in logarithm function where dependent variable was employment multiplied with human capital index and independent variables were output, rent (capital price), wages and constant elasticity substitution. Labor Supply for skilled labor consist of High skilled labor employed divided by the population of high skilled labor as the dependent variable and the independent variables were high skilled wages, time and price. The population of high skilled labor was derived from migration and population of high skilled labor lagged one year. The same function of high skilled labor was same with the low skilled labor but differ at market clearing and non- market clearing. Market clearing means low skilled labor is adjusted at the replacement threshold ratio. Wages and labor participation adjust to clear market. Non- market clearing means low skilled labor is adjusted above the replacement threshold ratio. Bergin & Kearney (2007) were emphasizing on labor supply side that built together with internal and external determinant (openness).

Kon (2012) identified the determinant of employment elasticity with respect to economic growth by deriving labor supply and demand. Labor supply was derived with wage as dependent variable and labor force and other supply factors as independent variables. Labor demand was derived by labor employed as dependent variable and output, wage rate and other demand factors as independent variables. This study found that employment elasticity has positive effect on wages elasticity from supply labor side. During economic growth, more jobs are created to increase more output and revenue. Thus, income effect of wage is also increase due to output

growth. The low wage elasticity from supply side was also explained by mobility of labor between booming sectors and declining one. Employment elasticity also has positive effect on wage elasticity for demand labor side. This could be explained by low employment elasticity also lowered the elasticity of labor demand with respect to output. It does mean the other factors, capital or technology have been employed more than labor. Kon's (2012) labor supply which treated wages as dependent variable and employment treated as independent variable was opposite with Bergin & Kearney (2007) who employed employment as dependent variable and wages acted as independent variable.

2.2.4 Government intervention in Labor Market

Hefeker & Neugart (2010) was studying the government regulation on labor market. Government seemed to undertake political costly effort to regulate labor market in order to lowering unemployment. Government regulation are regarding to any regulation that increase hiring and firing cost, benefit system and Minimum Wages law that increase employment. The study ended up with result that government policy deregulation lead to more 1 percent of unemployment. Hefeker & Neugart (2010) provides a new approach to analyse the movement of labor market when government intervention factor was involved.

Cerda & Larrain (2010) demonstrated the effect of corporate taxes on labor demand. Corporate taxes increased not only reduced demand for capital but labor demand also reduced since input of capital and labor are complementary. Impressively, the effect on labor demand for large firms was larger than smaller firms. Capital demand for smaller firms was more sensitive than larger firms. The capital cost consists of capital cost as dependent variable and interest rate, expected capital gain,

depreciation rate and corporate taxes as independent variables. Then, Labor demand was derived with employed labor as independent variable and output, wages, capital cost and price of imported good and Capital demand was derived with employed capital as independent variable and output, wages, capital cost and price of imported good. The smaller bank have little access to banks compared the larger firms where makes capital demand for smaller firms are lower and lending risk for smaller firms also higher. The result also indicated that the cross input price of capital with price of labor was signed negative which mean there were complementary between capital and labor. Real exchange rate (price of import) was positively significant affected Labor demand but not labor supply. It was showing that substitution between imported input with labor but not significant on capital. Meanwhile, business effect have less stringent effect on financial condition showed that it was easier to obtain financial lending to hire more capital and labor. Corporate tax seemed to give negatively and significantly effect on demand of labor and capital. One percent increasing of corporate tax will yield 0.12 percent and 0.2 percent falling in capital demand and labor demand respectively. This study is very similar with Graham & Spence's (1998) and Kon's (2012) study however Cerda & Larrain (2010) added corporate taxes and price of imports as new determinants of labor supply.

Agenor (2005) studied on employment and the degree of openness if price of government services increasing. Since price of government services increased to finance budget deficit (contrary fiscal policy), the employment and wages rates also affected. For example domestic fuel price also considered as public good since it was subsidized by government. Lowering the fuel subsidized was resulting higher cost of production. Unemployment effect was accompanied by the decreasing of output. This study treated employment of unskilled and skilled labor as dependent variable

and wages of skilled and unskilled labor, minimum wages rate and government services price as independent variable. The other one function was designed with wages rate at equilibrium as dependent variable and real exchange rate and price of exportable good as independent variables. Depreciation of real exchange rate will lead to increase wage at equilibrium and unskilled labor employment. Unlike with Carter's (2005) study, Agenor (2005) show how fiscal policy tend to affected employment and wage rate.

2.3 Unskilled Labor Market

2.3.1 Skilled Bias Technological Change, SBTC effect

Bhulaor & Krinpornsak (2008) was studying on high Skilled and low skilled labor demand of Thailand labor market (from 1991 to 1995). This study found decreasing of relative wages between skilled and unskilled labor (from 1991 to 1995) was caused by rapidly increasing in number of graduate entering in labor market. This study distinguished between skilled labor as nonproduction labor and unskilled labor as production labor. Technological change led to increase the demand of skilled labor (Skilled Bias Technological Change, SBTC effect). Meanwhile the decreasing of demand for unskilled labor was translated into the falling of good and services produced by them through international trade (trade effect). The determinants of labor supply was initiated from domestic condition such as 1) predictable factors such birth rate and health status were assumed to adjust automatically to equilibrium, 2) shock factor (unpredictable) such accessibility of education and labor mobility, 3) migration where openness allowed the outflow of skilled labor and inflow of unskilled labor and raised relative wages. In other case, unskilled labor was easily replaced by cheaper foreign labor and reduced labor bargaining power. 4)

Institutional force where minimum wages law reduce wage gaps between skilled and unskilled labor. Labor union tends to increase labor cost due to negotiation between employers and labor. The labor supplied is decreased when wage is raising and the effect on employment and wage is larger if labor demand is flatter. Labor demand determinants were influenced by external factor such as 1) trade effect and 2) SBTC. Bhulaor & Krinpornsak's (2008) approach was very similar with Kon (2012) who look labor demand and labor supply jointly. But Bhulaor & Krinpornsak's (2008) included the trade and technology determinants in their study.

Rusmawati & Asmaddy (2008) studied the effect of Skilled Biased Technology Change, SBTC and International Trade on United Kingdom and Malaysian labor market. Suppose developed countries tend to demand more skilled labor and developing countries tend to demand more unskilled labor. There are rising in price of good unskilled labor produced and rising of relative demand for unskilled. The study concluded the increasing of international trade escalating more productivity of skilled labor. In addition, the stringent labor market in manufacturing sector of Malaysia caused by the rapid change in job growth in manufacturing sector and the mismatch between demand and supply labor of unskilled labor. The finding also said the international trade caused change of labor demand and shifted employment between sectors (Shift between sectors effect). But, SBTC was reflected by relatively shifted of labor demand within sectors (Shift within sectors effect). Other findings were 1) shift within sector effect was dominated by relative change of male-skilled labor demand (secondary and degree education) 2) shift between sectors effect dominated by unskilled labor (lower education). 3) Between sectors effect was more dominant within sectors effect 4) International trade lifted relative demand for male unskilled labor and SBTC increase labor demand for male labor with secondary

education 5) the similar result goes to female labor. Bhulaor & Krinpornsak's (2008) and Rusmawati & Asmaddy's (2008) study look similar but Rusmawati & Asmaddy's (2008) study extended to the movement of unskilled and skilled labor relatively within and between sectors.

Rich (2010) separated the estimation of substitution with scale responses to knew Skill- biased technical change, SBTC effect on elasticity of labor demand. SBTC will change elasticity of labor demand through substitution effect. The finding said that 1) own- wages elasticity (contarary with cross-wage elasticity) labor demand of production labor was more elasticity than non- production labor, 2) cross-price elasticity like energy and capital became stronger substitute for production and non-production labor (complementary between labor with energy and capital). 3) The substitution between production with non- production shift to complement relationship. 4) own-wage scale response (opposite with cross-wage response) for production labor was greater than non-production labor since production labor share a greater cost 5) own- wages elasticity was decreasing for production labor overtime but own- wages elasticity for non-production labor was decreasing 6) scale of response tend to moderate the substitution between energy and capital 7) complementarity between labor and raw material and complementarity between production labor with non –production labor was estimated to increase overtime and 8) increasing of import penetration (foreign competition) will reduce domestic production and made labor demand more elastic. Bhulaor & Krinpornsak's (2008) and Rich (2010) shared a similar study by analysing on production labor (skilled labor) and non- production (unskilled labor). However, Rich (2010) ignored the institutional force determinant and Bhulaor & Krinpornsak's (2008) ignored other

input factors like energy and capital. Their finding was also slightly different even their studies look very similar.

2.3.2 Immigrant effect on Unskilled labor Market.

Sayre (2001) investigated the declining on return of Palestinian Schooling return from 1981 to 1987 and its recovery from 1987 to 1991 since Palestinian Labor demand determined by return of schooling by using two stage of least square. The determinants of labor supply of unskilled labor were wage of unskilled labor, wage of Palestinian work at Israel and price of capital. This study suggested 1) trade liberalization tend to increase labor demand in developed country 2) trade expansion tend to shift labor demand to unskilled labor and decreased wage relatively 3) falling in oil price at Persian Gulf made more Palestinian leave their Job Oils at abroad and decrease Palestinian migrated to abroad. 4) More labor demand of Palestinian unskilled labor at Israel decrease the relative wages between skilled and unskilled labor at Palestine. The study found that increase of Palestinian immigration to Israel narrowed the wage gaps between skilled and unskilled labor at 2.8 percent. The number arrived tourists as alternative instrument variable for immigrant variable is the main contribution in Sayre (2001) theory. Sayre's (2001) and Bhulaor & Krinpornsak's (2008) study shared similar trade effect determinant on skilled and unskilled labor market but Sayre (2001) more focusing on effect of immigrant.

2.3.3 Effect of Import on Unskilled labor Demand

Vu (2012) investigated the impact of import on demand for skilled and unskilled labor of Australia by employing unit cost function. This study consist of two model where first model demonstrating the impact of import on aggregate labor demand and the other one was the impact of import on unskilled and skilled labor demand. By deriving a cost function the result of estimation suggested that one percent drop in price of input will yield 0.08 percent falling in labor demand. It reflected the displacement effect import on domestic output. There were negative and significantly elasticity of import with respect to unskilled labor suggested that a poor complementary between import and unskilled labor. Meanwhile the elasticity of import for skilled labor signed positively and significantly correlated. One percent falling in one percent of import price will lead to decrease about 0.15 percent in demand of unskilled labor. Thus greater wage gap between skilled and unskilled labor occur without presence of import. In Australia, imported capital was more likely to replace skilled labor rather than unskilled labor. The cross elasticity capital and labor demand was signed positive where one percent fall in rental rate of the capital, labor demand will decrease about 0.11 percent. It was prove the capital accumulation induced wage gap between skilled and unskilled labor. One percent decrease in rental rate of capital reduced unskilled labor demand at 0.09 percent and lifted skilled labor demand at 0.14 percent. Similar with Rich (2010), this study look deeply into effect price of other inputs; import price and rental rate on skilled labor and unskilled labor and generated the similar result.

2.4 Wage, Employment and Productivity.

Graham & Spence (1998) reformulated labor demand model which incorporating input price and technology growth effect. They re-outlined the theoretical basis of

the Shift Share method to analysis regional labor productivity from 1985 to 1992 for 11 British regions. The Shift- share Analysis (SSA) used for knowing the degree to which pattern of regional employment change due to either structural composition of regional industries or locational or competitive effect. The employment of industry *i* at region *j* was acted as dependent variable and price of labor, capital, output and technology of industry *i* at region *j* were acted as independent variables. This study concluded that 1) technology force unemployment to reduce in manufacturing industries, 2) wage served to reduce employment. 3) The poor level of output was caused by low changes in employment, 4) job losses occur was corresponding with increasing of labor productivity at East Midland Britain in textile, transport, machinery, rubber and plastic and 6) declining employment was accompanied by falling in output of manufacturing sector. Graham & Spence's (1998) labor demand function was supported by Kon's (2012) labor demand function where employment was treated as dependent variable and wages treated as independent variable even they were using different models.

Ho & Yap (2001) employed Error Correction Model (ECM) to analyse long run and short run dynamic change of wages across 13 selected Malaysian manufacturing subs –sector. This study adapted the Carneiro's (1998) argument upon the Union Firm Bargaining Model. Thus, change of real wage was considered as dependent variable and change in productivity, unemployment, union density and deviation between actual and the long run equilibrium value of real wage treated as independent variables. The result of analysis were; 1) one percent increasing of labor productivity was resulting 1.96 percent increasing of real wage. This can be explained with the increasing efforts and skills of labor (appropriate with efficiency wages theory) 2) wages increased greater than labor productivity was yielding

increasing of labor cost and decreasing of competitiveness 3) unemployment rate increased at one percent will cause 0.73 percent wage to increase. This small elasticity of labor demand was caused by the stickiness of wage adjustment 4) increasing of union density at one percent caused wage to increase by 1.2 percent (more stronger union trade will lift more demanding in wage which appropriate with the Wage Bargaining Model). The Short Run dynamic effect showed that 1) there was negative relationship between wages and labor productivity which showing the rigidity and lag of wage adjustment in collective bargaining 2) unemployment rate reduced wage by 0.463 percent at one percent significant. Long run for 13 selected manufacturing sub- sectors suggested; 1) Labor productivity positively and significantly affected wage of selected sub- sectors 2) unemployment rate negatively related to wage (exception for food and tobacco sub- sectors) 3) union density gave negative effect on wage for some sub-sectors. Unlike with our previous literature discussion, Ho & Yap (2001) showed analysis where we can see the relationship of labor market in long run and short run. Interestingly, there was rigidity between productivity and wages which showed negative sign in short run but in the long run the sign showed positive relationship which indicates the perfectly flexible labor market. Ho & Yap's (2001) finding was appeared to Carter (2005) suggestion where rigidity of labor market only occurred in short run.

Regarding to competitive market labor, Starevska (2011) highly depending on factor intensities and wages differential between sectors will lead to reduce unemployment by increasing labor endowment. Each country has different in term of relative factor endowment and then, the high- wages industry will experience high unemployment if they compete internationally. The unemployment will move from low- wages good exporter country toward high low- wages good. Moreover, the author has

stated the international trade enhance the total output of trading countries, the per capita world output and the rose wages rate due to economic of scale. However, the effect will yield more unemployment and at the same time increasing of productivity (due to economic of scale) invites more firm entrants that will increase employment. This opposing effect on employment is depending on unemployment benefits.

Dobija (2011) suggest any compensation on labor must be above than 8 percent of employee's human capital; otherwise, they are likely to migrate to countries with high payment consistency. This 8 percent is optimal capitalization rate need to fulfil to maintain the loyalty of labor. Human capital is defined as ability of worker to do work. Since Human capital model is derived by general model and Compensating model derived from Human Capital Model, constant fair payment is the most important factor to counterbalance the loss of physical and mental contribution during work. Thus, fair- constant payment needs to maintain at 8 percent or above from employee's human capital.

There are also other factors that effect on unemployment that needs to consider with. Such Dority (2007) study, the finding suggest that increasing of immigrant lead to lower unemployment rate, which mean that immigrant was attracted by the strong domestic labor demand. Moreover, unemployment is unrelated with disinflation due to adjustment of labor market on price expectation and no longer surprised by price shock.

Mouhammed (2012) employed a simple function to determine unemployment problem with productivity of labor where more productivity lowered unemployment through increasing of total revenue relative to wages (firm able to hire more labors). Unemployment cannot be eliminated but can be reduced over business cycle. At first phase of expansionary business cycle, unemployment is decreasing and wages

decreasing but at late phase of expansionary, productivity and employment is decreasing. This study suggests that increasing of interest rate leads to decrease investment and lowering labor demand. The real wage is depreciated if the inflation rate increasing and finally reduces labor demand. The result said unemployment in non-farm sector is decreasing when productivity increase at 99 percent level of significant. Mouhammed (2012) proved that the unemployment is relating with productivity problem. Finding suggested that higher productivity will yield more labor demand and significantly raising firm's profit relatively to wages. In other case, if productivity rates increase higher than wages rate, inflation and unemployment rate is declining.

Bonnie & Gyapong (2012) was employing Structural Vector Autoregression (SVAR) to explain dynamic effect wages changes in Ghana by sector. If wages increasing faster than increasing productivity, firms are facing a higher labor cost and the cost labors burden will be translated into higher product price. Increasing of wages in Agriculture will yield temporary decrease in employment but within a year (short run) employment is increasing afterward. There were many crops that required more labor to harvest in short run. There was no effect of increasing wages in long run. Meanwhile, increasing in manufacturing sector stimulated productivity in short run but no effect in long run. Increasing of wages in manufacturing and agriculture sectors only raised product price. Their study also found the short run effect of increasing of wages in manufacturing sector was resulting more labor hiring. This implied that the result inconsistent with firm maximizing profit motive. Many firms in Ghana complied with Minimum wages law and if wages increases but the productivity decreasing or remained unchanged, the firms need to hire more labor.

Wye & Rahimah (2012) found out which potential economic sectors can be treated as sources to economic growth by using data set from 1975 to 2005. Annual growth of Output per labor was considered as dependent variable and Annual growth of capital per labor, labor and total factor productivity was treated as independent variables. Higher labor productivity was translated into high value added production through innovation progressing. This study found that 1) Output per labor (labor productivity) and Capital per labor (capital intensity) were contributed by manufacturing; 3.25 percent and 4.97 percent, services; 5.58 percent and 9.88 percent, and mining; 40.47 percent and 37.23 percent respectively. 2) Service was the major contribution than manufacturing in labor productivity and capital intensity 3) service sector did not affected by total factor productivity 4) major source of labor productivity fuelled by quantity of labor at 147.64 percent but not total factor productivity at -72.94 percent for all sector 5) Malaysian services sector still labor intensity and most relied heavily on foreign labor sector. However, Wye & Rahimah (2012) was a not involved agriculture sector in their study. Interestingly, their finding suggested most sectors still rely on quantity of labor but not on technology usage (total factor productivity) to boost output growth unlike with developed country which most rely on technology to boost output growth.

Selamah (2008) investigated the dynamic behaviour of real wages, employment and productivity which associated with Classical and neoclassical, Keynesian, Performance based Pay Scheme, PBP and Wage Theory on Manufacturing Sector. This study suggested higher wages help to improve more labor productivity by allowing labor to receive higher nutrition and medical care that preserved their health and physical ability. However higher wage in turned to be substituted with capital due to higher labor cost. The finding of short run said small shock on

employment has a little impact on wage was appeared to have short impact on productivity. The finding of long run, there were positive effect of productivity and employment on real wages that explained the PBP theory. Selamah (2008) was dissimilar with our previous discussion where her study was not relied on certain theory only but she used various theories to relate the relationship between wage with employment and productivity for Malaysian case. Contrary with Ho & Yap's (2001) finding, Selamah (2008) found positive effect of wages on employment in long run.

2.5 Conclusion

From the previous works, the Malaysian labor market is influence by wage rigidity but less stringent compared to others countries. The wage rigidity presence can be detected if there less responsiveness of wage on employment. In addition, the previous work also suggested the variables that associated with unskilled labor demand and also shows how they react with unskilled labor employment. However, the sign of the coefficients of these variables are suggested to be positive or negative depending on country case and econometric tools.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Introduction

The data and methodology will be discussed in this chapter. The data definition and their sources are showed in section 3.2. Then, the Model Specification in the 3.3 shows how unskilled labor model is built. Then 3.4 section indicates that the method and procedures of the analysis.

3.2 Data

This study employs data of 13 years (from 2000 to 2012) of Malaysian manufacturing, agriculture and services sectors. The variables of this study consist of the unskilled labor employment, total nominal wages paid to unskilled labor, foreign labor, output produced across sectors, interest rate and exchange rate. Those data are retrieved from the Department of Statistics of Malaysia Website. Variables such as exchange rate and interest rate are obtained from International Monetary Fund, IMF yearbook.

However, unskilled labor employment across sectors is obtained via doing some guessing and calculation. The legislators, senior official and manager, professionals, technicians, associate professional, clerical, services worker and shop and market sales workers are defined as skilled labor and for the rest occupations are defined as unskilled labor according to International Standard Classification of Occupation, ISCO-1988 (Bhulaor & Kripornsak, 2008). The Department of Statistics Malaysia reports the percentage distribution of employed person by occupation (manager, professional, technicians and associate professionals, clerical support workers,

service and sales workers, skilled agriculture, forestry and fishery workers, craft and relate trades workers, plant and machine-operator and assemblers and elementary occupation) and the total employment by industry.

The occupation of skilled agriculture, forestry and fishery workers, craft and relate trades workers, plant and machine-operator and assemblers and elementary occupation are defined as unskilled labor in this study. To obtain total percentage of unskilled labor for each year, all the percentages of occupation that classified as unskilled labor are sum up for each year. Then, multiply total percentage of unskilled labor with total employment by industry each year is producing total unskilled labor employment by industry for each year.

The wage variable is measured by the total wage paid to unskilled labor which available in Malaysian Yearbook of Statistic. The interest rate measures the capital price variable; and exchange rate measures imported input price variable where they can be obtained in International Monetary Fund yearbook. The foreign labor employment variable can be retrieve at the Department of Statistics website.

3.3 Model Specification.

Firstly, the labor market is assumed to be free from wage rigidity. The unskilled labor demand model is measures without wage rigidity influence. In addition Tang (2012) suggested that Malaysia has a less stringent labor market. As suggest by Carter (2005), the rigidity of wages only presence in short term.

Kon (2012) constructed the labor demand as following:

$$L = L(W, Q, X) \qquad (3.1)$$

Where W is wage rate, L is labor employed the Q is output or GDP and the X is other demand factor variables.

Labor Demand derived by Bonnie & Gyapong (2012) has some similarities with Kon (2012). However, Bonnie & Gyapong (2012) derived labor demand equations and using Structural Vector Autoregeression, SVAR to look on dynamics implication for wages changes and Productivity.

$$L^{*} = f(T, W, e, Q). \qquad (3.2)$$

Where L^{*} is the optimal employment, T is Technology and e is effort (productivity).

Note that technology is not included in this study since the Total Factor Productivity,(TFP) per labor growth by including Information & Communication Technology (ICT) intensity and human capital intensity is less effected for Malaysian case (Wye & Rahmah, 2012). The model of unskilled labor is derived as following:

$$L_{it} = \beta_1 + \beta_2 W_{it} + \beta_3 Q_{it} + \beta_4 I_t + \beta_5 Exc_t + \beta_6 Fl_t + \varepsilon_t \qquad (3.3)$$

Where L_{it} is unskilled Labor Employed at time t in sector i, t is time, wage paid to unskilled labor at time t, W_{it} nominal wage paid to unskilled labor at time t in sector i, Q_t is Output produced at time t in sector i, I_t is interest rate at time t, Exc_t is exchange rate at time t, Fl_t is foreign labor employment at time t and ε_t is error term.

The equation of 3.3 is transformed into logarithm function to show the elasticity of unskilled labor demand with respect to its determinants:

$$\log L_{it} = \beta_1 + \beta_2 \log W_{it} + \beta_3 \log Q_{it} + \beta_4 \log I_t + \beta_5 \log Exc_t + \beta_6 \log Fl_t + \varepsilon_t \quad (3.4)$$

The coefficeint of $\beta_2, \beta_3, \beta_4, \beta_5$and β_6 should be negative or positive sign as suggested from the previous findings.

3.4 Measurement of Variables.

In Unskilled labor demand, the unskilled labor employment is treated as dependent variable and the nominal wage paid to unskilled labor, the output produced, interest rate, exchange rate and the foreign labor employment are treated as independent variables.

a) The nominal wage paid to unskilled labor.

This variable frequently discussed in previous study to affect labor employment. Since the data available in term of annually nominal wage paid to unskilled labor, this study will employed this variable in order to represent wage. There are two kinds of wage which are; nominal wages and real wage. Since the real wages is:

$$R_t = \frac{W_t}{P_t} \qquad (3.5)$$

Where,R_t is Real wage at time t, W_t is nominal wage at time t and $P_t$is Deflator factor at time t.

If The Equation 3.11 is transformed into logarithm form:

$$\log(\frac{W_t}{P_t}) = \log W_t - \log P_t \qquad (3.6)$$

If the Equation of 3.4 included into unskilled labor demand model, the variable $\log P_t$ will be absorbed by the intercept in the models (Wooldrige, 2013). The unskilled labor employed.

The employment is represented by the total unskilled labor annually employed (Bonnie & Gyapong. 2012). The employment can be negatively (Iancu, Popescu, & Popescu, 2011) and positively (Selamah, 2008 & Carter, 2005) associated with wages according theory to the Economics Labor. Labor employment is one of major input that can influence output produced (Bonnie & Gyapong. 2012) where the variable also can be positively (Agenor, 2005) and negatively (Carter, 2005) influence output produced.

b) The Output produced.

The production produced across sector represents the variable output in unskilled labor demand model. However, the output and productivity (effort) variable cannot be included together in the model since the labor productivity was represented by ratio of output produced to labor employment (Bonnie & Gyapong. 2012). The productivity can be expressed as:

$$E_t = \frac{Q_t}{L_t} \qquad (3.7)$$

Where, E_t is the labor productivity, Q_t is the output produced and L_t is the labor employed.

Then, the Equation 3.7 is transformed into log model:

$$\log E_t = \log Q_t - \log L_t \qquad (3.8)$$

From the Equation 3.14, the $\log Q_t$ and $\log L_t$ is implicitly showed the productivity in the model.

There is positive relationship between wage and labor productivity (Tang, 2012) since labor productivity represent the ability of labor to produced goods and services. Thus, more unskilled labor productivity will

drive wages rate to increase. However, there is relationship between employment and productivity could be negative (Carter, 2005) due to The Diminishing Marginal Return effect and positive (Agenor, 2005).

c) The Interest rate.

The relationship between labor employment could be positive (Cerda & Larrain, 2010) and negative (Rich, 2010). The best combination of capital intensity and technology improvement with labor employment will lead to the increasing of productivity rate in Services sector (The Productivity Report, 2013) and promote more unskilled labor demand. In other side, the poor combination between capitals with unskilled labor may cause that the poor production performance in Agriculture (The Productivity Report, 2013) and reduce the unskilled labor demand. This price of capital is represented by interest of lending rate.

d) The foreign labor employment.

The sign function of unskilled labor could be negative with foreign labor (Bergin & Kearney. 2007). It does mean local unskilled labor tend to be replaced by foreign labors because they offer a cheaper wages compared to unskilled labor. The low mean wage in construction sector was determined by a huge number of foreign labor employment (The Productivity Report, 2013). Then, the unskilled labor participant in construction will decrease by mean of the low mean wage.

e) Exchange rate

The production of goods and services not only using capital and labor combination but imported input (such as imported raw material, machine and capital) also employed in the production especially in manufacturing. If the relationship the between the imported input cost is positively associated with unskilled labor employment (Cerda & Larrain, 2010), it suggests that the unskilled labor and imported input is complement. If the sign of the cost of imported input is negative, the unskilled labor and imported input is substitute input.

The exchange rate denotes as the cost of imported input (Cerda & Larrain, 2010) where:

$$\text{Exc} = \frac{\text{cost of imported input}}{\text{cost of local input}} \tag{3.9}$$

Where, Exc denote as exchange rate. Thus, exchange rate represents the cost of imported input in our study.

3.5 The Procedure of Analysis.

The panel data anlaysis of this study which employs the Panel Unit Root test, Panel Cointegration and Panel Fully modified (Lau, Chye & Chong (2011) and Adhikari & Chen (2012)).

3.5.1 Panel Unit Root test.

The porpose of panel unit root test is to identify the stationarity of variables series in this study. Interestingly, the unit root for panel has a higher power compared than

unit root test for individual time series. There are four different type statistics which are; Levin, Lin & Chu, LLC statistic (assumes common unit root process), Im, Pesaran & Shin, IPS statistic, ADF- Fisher Chi- Square statistic and PP- Fisher Chi-Square (assumes individual unit root process).

This study employs Levin, Lin & Chu, and LLC statistic to represent a common unit root test process and Im, Pesaran & Shin, IPS to represent individual root test process.

The LLC test is restrictive in the sense that it requires ρ to be homogenous across *i*. The test process is showed as following:

a. Suppose the separate augmented Dickey – Fuller (ADF) regression for each cross-section is:

$$\Delta y_{it} = \rho_i y_{i,t-1} + \sum_{L=1}^{\rho_i} \theta_{iL} \Delta y_{i,t-L} + \propto_{mi} d_{mt} + \varepsilon_{it} \qquad (3.10)$$

Where $d_{mt}$is the vector of deterministic variables ($d_{1t} = \{\text{empty set}\}$,$d_{3t} = \{1, t\}$) and $d_{2t} = \{1\}$, $\propto_{mi}$ is the corresponding vector of coefficients for model $m = 1,2,3$ and ρ_i is lag order. For given *T* (time), choose a maximum lag order ρ_{max} and then use $\hat{\theta}_{iL}$ to determine if a smaller lag order is preferred. Under null hypothesis θ_{iL} is zero when$\rho_i \leq 0$.

b. Once ρ_i is determined two regressions are run to obtain *orthogonalized residuals*:

Run Δy_{it} on Δy_{it-L} ($L = 1, \dots, \rho_i$) and d_{mt} to get residuals $\hat{e}_{it}$

Run $y_{i,t-1}$ on Δy_{it-L} ($L = 1, \dots, \rho_i$) and d_{mt} to get residuals $\hat{v}_{it}$.

To control for different variances across cross-section, the $\hat{e}_{it}$ and $\hat{v}_{it}$ must be standardized:

$$\tilde{e}_{it} = \frac{\hat{e}_{it}}{\hat{\sigma}_{\varepsilon i}} \text{ and } \tilde{v}_{it-1} = \frac{\hat{v}_{it}}{\hat{\sigma}_{\varepsilon i}} \quad (3.11)$$

$\hat{\sigma}_{\varepsilon i}$ is standard error from each ADF regression, for i= 1,…., N.

c. Estimate the ratio of long-run to short run standard deviations. First, the long-run variance can be estimated as following:

$$\hat{\sigma}_{yi}^2 = \frac{1}{T-1}\sum_{t=2}^{T}\Delta y_{it}^2 + 2\sum_{L=1}^{\bar{K}} w_{\bar{K}L}\left[\frac{1}{T-1}\sum_{t=2+L}^{T}\Delta y_{it}\Delta y_{i,t-L}\right] \quad (3.12)$$

Where $\bar{K}$ is a truncation lag that can be data-dependent and it must be obtained in manner that ensures the consistency of $\hat{\sigma}_{yi}^2$. For a Bartlett Kernel, $w_{\bar{K}L} = 1 - (\frac{L}{\bar{K}+1})$. For each cross section *i*, the ratio of long run standard deviation to the innovation standard deviation is estimated by $\hat{s}_i = \frac{\hat{\sigma}_{yi}}{\hat{\sigma}_{\varepsilon i}}$. The average standard deviation is estimated by:

$$\hat{S}_N = \frac{1}{N}\sum_{i=1}^{N}\hat{s}_i \quad (3.12)$$

d. Based on $N\tilde{T}$ observation where $\tilde{T} = T - \bar{\rho} - 1$. $\tilde{T}$ is the average number of observation per individual in the panel with $\bar{\rho} = \sum_{i=1}^{N}\rho_i/N$. The $\bar{\rho}$ is average lag order of individual ADF regressions. The LLC t-statistic is derived as following:

$$t_\rho = \frac{\hat{\rho}}{\hat{\sigma}(\hat{\rho})} \quad (3.11)$$

Where

$\hat{\rho} = \sum_{i=1}^{N} \sum_{t=2+p_i}^{T} \tilde{v}_{i,t-1}, \tilde{e}_{i,t} / \sum_{i=1}^{N} \sum_{t=2+p_i}^{T} \tilde{v}_{i,t-1}^2$

$\hat{\sigma}(\hat{\rho}) = \hat{\sigma}_{\tilde{\varepsilon}}^2 / \left[\sum_{i=1}^{N} \sum_{t=2+\rho_i}^{T_i} \tilde{v}_{i,t-1}^2 \right]^{1/2}$

and

$\hat{\sigma}_{\tilde{\varepsilon}}^2 = \frac{1}{N\tilde{T}} \sum_{i=1}^{N} \sum_{t=2+\rho_i}^{T_i} (\tilde{e}_{it} - \hat{\rho}\, \tilde{v}_{i,t-1})^2$ where $\hat{\sigma}_{\tilde{\varepsilon}}^2$ is the estimated variance of $\tilde{\varepsilon}_{it}$.

The null hypothesis for LLC implies there is a common unit root test process across the cross- sections, whereas the hypothesis alternate contains no unit root test process. The null hypothesis is rejected if LLC t- statistic greater than t-critical or the probability of t-statistic greater than any significant level.

The IPS test allows for a heterogeneous coefficient of $y_{i,t-1}$ and suggests an average of the ADF tests when $\mu_{i,t}$ is serially correlated with different serial correlation properties across *i*. The IPS t -bar statistic is defined as the average of individual ADF statistic as:

$$\bar{t} = \frac{1}{N} \sum_{i=1}^{N} t_{\rho_i} \qquad (3.12)$$

Where $t_{\rho_i}$the individual t- statistic for testing the hypothesis null where there is an unit root process for all *i*. IPS provide simulated critical value for $\bar{t}$ for different number of cross section, *N* and series length, *T*. The $\bar{t}$ also has an asymptotic *N* (0,1) distribution. Starting from the well- known result in time series that for a fixed *N*

$$t_{\rho_i} \Rightarrow \frac{\int_0^1 W_{iZ} dW_{iZ}}{\left[\int_0^1 W_{iZ}^2\right]} = t_{iT} \qquad (3.13)$$

as $T \rightarrow \infty$ where $\int W(r)dr$ denotes a Wiener integral with argument *r* supressed in (3.13). The IPS statistic assumes that t_{iT} are independent and identically distributed and have finite mean and variance. For the IPS test, the hypothesis null assumes there is an individual unit root process and the hypothesis alternate suggest no individual unit root process.

3.5.2 Kao panel cointegration Test

The Panel Cointegration test is to determine whether the Unskilled Labor Demand is cointegration (has long-run relationship) or not. The benefit of doing this test are; allowing common time factor and heterogeneity across sectors (by examine the within-dimension test) and permitting for the heterogeneity of parameters across countries (by examine the between -dimension test).

Kao (1999) proposed that cross- section specific intercept and homogenous coefficient are specified on the first-stage regressors (Lau, Chye & Chong, 2011). Consider the panel regression model:

$$y_{it} = x'_{it}\beta + z'_{it}\gamma + e_{it} \qquad (3.14)$$

Where y_{it} and x_{it} are I(1) and noncointegrated. For $z_{it} = \{\mu_i\}$, Kao (1999) suggested DF and ADF- type unit root tests for e_{it} as a test for the null of no cointegration. DF-type test can be calculated from the fixed effects residuals:

$$\hat{e}_{it} = \rho\hat{e}_{it-1} + v_{it} \qquad (3.15)$$

Where $\hat{e}_{it} = \tilde{y}_{it} - \tilde{x}_{it}\hat{\beta}$ and $\tilde{y}_{it} = y_{it} - \bar{y}_{it}$. The null hypothesis of no cointegration can be expressed as $H_0: \rho = 1$. The OLS estimate ρ and the t-statistic are given as:

$$\hat{\rho} = \frac{\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\hat{e}_{it}\hat{e}_{it-1}}{\sum_{i=1}^{N}\sum_{t=2+p_i}^{T}\hat{e}_{it}^2} \qquad (3.16)$$

and

$$t_\rho = \frac{(\hat{\rho}-1)\sqrt{\sum_{i=1}^{N}\sum_{t=2}^{T}\hat{e}_{it-1}^2}}{s_e} \qquad (3.17)$$

where $s_e^2 = \frac{1}{NT}\sum_{i=1}^{N}\sum_{t=2}^{T}(\hat{e}_{it} = \hat{\rho}\hat{e}_{it-1})^2$. Kao (1999) proposed the following four DF- type tests:

$$DF_\rho = \frac{\sqrt{N}T(\hat{\rho}-1)+3\sqrt{N}}{\sqrt{10.2}} \qquad (3.18)$$

$$DF_t = \sqrt{1.25}t_\rho + \sqrt{1.875N} \qquad (3.19)$$

$$DF_\rho^* = \frac{\sqrt{N}T(\hat{\rho}-1)+\frac{3\sqrt{N}\hat{\sigma}_v^2}{\hat{\sigma}_{0v}^2}}{\sqrt{3+\frac{36\hat{\sigma}_v^4}{5\hat{\sigma}_{0v}^4}}} \qquad (3.20)$$

$$DF_t^* = \frac{t_\rho+\frac{\sqrt{6N}\hat{\sigma}_v}{2\hat{\sigma}_v}}{\sqrt{\frac{\hat{\sigma}_{0v}^2}{2\hat{\sigma}_v^2}+\frac{3\hat{\sigma}_v^2}{10\hat{\sigma}_{0v}^2}}} \qquad (3.21)$$

where $\hat{\sigma}_v^2 = \sum_{yy} - \sum_{yy}\sum_{xx}^{-1}$ and $\hat{\sigma}_{0v}^2 = \hat{\Omega}_{yy} - \hat{\Omega}_{yx}\hat{\Omega}_{xx}^{-1}$. The DF_ρ and DF_t are based on the strong exogeneity of regressors and errors. The DF_ρ^* and DF_t^* are for the cointegration with endogenous relationship between regresors and errors.

The ADF test can be ran as following:

$$\hat{e}_{it} = \rho\hat{e}_{it-1} + \sum_{j=1}^{p}\vartheta_j\Delta\,\hat{e}_{it-j} + v_{itp} \qquad (3.22)$$

with the null hypothesis of no cointegration, the ADF test statistic can be constructed as following:

$$\mathrm{ADF}_{\mathrm{t}}^{*}=\frac{\mathrm{t}_{\mathrm{ADF}}+\frac{\sqrt{6\mathrm{N}}\hat{\sigma}_{\mathrm{v}}}{2\hat{\sigma}_{\mathrm{v}}}}{\sqrt{\frac{\hat{\sigma}_{0\mathrm{v}}^{2}}{2\hat{\sigma}_{\mathrm{v}}^{2}}+\frac{3\hat{\sigma}_{\mathrm{v}}^{2}}{10\hat{\sigma}_{0\mathrm{v}}^{2}}}} \qquad (3.23)$$

where $\mathrm{t}_{\mathrm{ADF}}$ is t- statistic of ρ in (3.22). The asymptotic distributionDF_{ρ}, DF_{t}, DF_{ρ}^{*}, $\mathrm{DF}_{\mathrm{t}}^{*}$ and ADF converge to a normal distribution $N(0,1)$ by sequential limit theory.

3.5.3 Panel Fully Modified OLS (FMOLS) Estimates

The purpose of FMOLS estimation is to obtain the long-run cointegration relationship of the unskilled labor demand model. This estimation means to accommodate the heterogeneity that existed in transitional serial correlation dynamic and in the long run cointegration relationship. The advantage of using this estimation is; correcting the standard OLS bias caused by the endogeneity and serial correlation of the regressors.

According to Lau, Chye & Chong, (2011), Pedroni (2000, 2001) expressed the cointegrated system for panel data of:

$$\mathrm{Y}_{\mathrm{it}}=\mathrm{a}_{\mathrm{i}}+\beta\mathrm{X}_{\mathrm{it}}+\mu_{\mathrm{it}} \qquad (3.24)$$

$$\mathrm{X}_{\mathrm{it}}=\mathrm{X}_{\mathrm{it}-1}+\mathrm{e}_{\mathrm{it}} \qquad (3.25)$$

where, i = 1,2…, N sectors over the period of t = 1,2…, M. In addition, $\mathrm{Z}_{\mathrm{it}}=(\mathrm{Y}_{\mathrm{it}},\mathrm{X}_{\mathrm{it}})'\sim I(1)$ and $\zeta_{\mathrm{it}}=(\mu_{\mathrm{it}},\mathrm{e}_{\mathrm{it}})'\sim I(0)$ with covariance matrix of $\Omega_{\mathrm{i}}=\Omega_{\mathrm{i}}^{0}+\Gamma_{\mathrm{i}}+\Gamma_{\mathrm{i}}'$ where Ω_{i}^{0} is the contemporaneous covariance, Γ_{i} is the weighted sum of autocovariances while $\Omega_{\mathrm{i}}=L_iL_i'$ in which L_i is the lower triangular decomposition of Ω_{i}. The panel FMOLS estimator for coefficient β as given as:

$$\beta_{FM}^{*}=N^{-1}\sum_{i=1}^{N}(\sum_{t=1}^{T}(X_{it}-\bar{X}_{it})^{2})^{-1}(\sum_{t=1}^{T}(X_{it}-\bar{X}_{it})Y_{it}^{*}-T\hat{\gamma}_{i}) \quad (3.26)$$

where, $Y_{it}^{*} = (Y_{it} - \bar{Y}) - \frac{\hat{L}_{2\,1i}}{\hat{L}_{2\,2i}}\Delta X_{it}$ and $\hat{\gamma}_i = \hat{\Gamma}_{2\,1i} + \hat{\Omega}_{2\,1i}^{0} - \frac{\hat{L}_{2\,1i}}{\hat{L}_{2\,2i}}(\hat{\Gamma}_{2\,2i} + \hat{\Omega}_{2\,2i}^{0})$

likewise, the associated t-statistic for the estimator can be constructed as:

$$t_{\beta_{FM}^{*}} = N^{-1/2} \sum_{i=1}^{N} t_{\beta_{FM,i}^{*}} \qquad (3.27)$$

where $t_{\beta_{FM,i}^{*}} = (\beta_{FM,i}^{*} - \beta_0)(\widehat{\Omega}_{1\,1i}^{-1} \sum_{t=1}^{t}(X_{it} - X_i)^2)^{1/2}$

The FMOLS estimation result will be reported into group mean and individually sectors of FMOLS estimators.

3.6 Conclusion

In panel analysis, the I(1) or I(0) process for each variable should be determined. The panel unit root test is employed for this purpose. The Panel Cointegration test is conducted if all variable is I(1) process. This test is conducted to verify whether the unskilled labor demand is cointegrated or not. Then, the coefficients for cointegration unskilled labor demand are determined by FMOLS estimation.

CHAPTER 4

THE ESTIMATION RESULT

4.1 Introduction

This chapter shows the result of panel analysis that discussed previously in the Section of 3.5. In the Panel data analysis, the Panel Unit Root test should be executed and reported first in order to determine the stationary of data series.

4.2 Panel Unit Root and Stationary Results.

This study employs Levin, Lin & Chu, (LLC) test to represent a common unit root test process and Im, Pesaran & Shin (IPS) to represent individual root test process and the result is showed as following:

Table 4.1: Panel Unit Root test result.

Variables	LLC Test				IPS Test			
	Level		First Difference		Level		First Difference	
	Intercept	Intercept &Trend	Intercept	Intercept &Trend	Intercept	Intercept &Trend	Intercept	Intercept &Trend
logL	7.95	17.19	-37.99***	-5.95 ***	2.8	2.51	-26.82***	-6.27***
LogW	5.19	17.92	-44.29***	-5.44 ***	3.1	1.8	-27.75***	-5.61***
LogQ	-0.93	-1.27	-4.85***	-5.26***	1.24	-0.35	-4.66***	-3.65***
LogFl	1.16	-2.27	-5.87***	-3.38 ***	1.63	0.67	-3.49***	-2.56***
logI	-0.97	-1.12	-3.6***	-4.17***	0.28	-0.74	0.04**	0.28
logExc	2.88	9.97	-5.871***	-4.47***	-1.05	-0.01	-7.3***	-5.51***

Note: (***) indicates the rejection of hypothesis null of non-stationary at 1 percent level of significant.

(**) indicates the rejection of hypothesis null of non-stationary at 5 percent level of significant.

The panel unit root test result suggest the series of variable of an I(1) process (stationary at first difference) at 1 percent level of significant in LLC test. However, the IPS test suggested the series of variable of an I(1) process at 1 percent except for logI where this variable with intercept is an I(1) process at 5 percent but not I(1) process with intercept and trend. The LLC test result allows this study to test the cointegration of Unskilled Labor Demand model.

4.3 Panel Cointegration Test

The Residual Pedroni Cointegration test allows the model to determine whether the Unskilled Labor model has long run relationship or not for panel data. The relationship can be tested by via Panel V- Stat, Panel Rho- Stat , Panel PP- Stat, Panel Adf- Stat, Group Rho- Stat, Group PP- Stat and Group Panel PP- Stat. If these statistic values are found to be statically significant (hypothesis null of no cointegration is rejected) then, the model is said to have a long run relationship. The panel cointegration consists of the test for panel statistic and individual statistic.

In the panel statistic, if there is a common AR coefficient within dimension, the model should be cointegrated. The Hypothesis null stated that there is no common AR coefficient within dimension which also means there is no cointegration in the unskilled labor demand model.

Table 4.2: Pedroni Residual Cointegration Test for panel statistic and test for group statistic

	Statistic
Panel V- Stat	3.33559***
Panel Rho- Stat	0.92739
Panel PP- Stat	-6.12392***
Panel Adf- Stat	-5.5476***
Group Rho- Stat	2.52372***
Group PP- Stat	-0.81875
Group Adf- Stat	-0.40821

Note: (***) indicates the rejection of hypothesis null of non-stationary at 1 percent level of significant.

The result indicates only the Panel Rho- Stat insignificant at any significant level. The Panel V- Stat, PP- Stat and Adf- Stat are significant at one percent where there is a common AR coefficient within sectors (Agriculture, Manufacturing and Services). In other words, three out of four panel statistics suggests the unskilled labor demand model is cointegrated within sectors. For Group statistic, the hypothesis alternate suggests there is a significant individual AR coefficient between sectors (unskilled labor demand model is cointegrated between sectors). The result indicates that only the Group Rho- Stat significant at one percent significant level where there is a significant individual AR coefficient between sectors (Agriculture, Manufacturing and Services). The PP- Stat and Adf- Stat are insignificant at any significant level. In other words, one of four group statistics suggests the unskilled labor demand model is cointegrated within sectors.

4.4 Panel FMOLS Estimation.

The Fully modified OLS is a method for estimating cointegration vector in dynamic panel data which allow considerable heterogeneity across individual members of panel. The advantage of using this method is; the group mean estimator is behaving well even in relatively small sample under a variety of scenarios (Pedroni, 2000).

Table 4.3: Individual Fully Modified OLS result

Variable	LogW	LogQ	LogEXC	LogI	LogFL
Agriculture	0.23***	-0.27***	-0.08***	1.29***	0.74***
	(3.97)	(-3.77)	(-2.80)	(4.85)	(5.08)
Manufacturing	0.80***	-0.19***	-0.01	0.06	0.08
	(13.67)	(-3.54)	(-1.21)	(0.66)	(1.08)
Services	0.81***	-0.11***	-0.001	-0.01	0.01
	(59.95)	(-6.48)	(-0.08)	(-0.39)	(0.73)

Note: (***) indicates the rejection of hypothesis null of non-stationary at 1 percent level of significant.

( ) indicates t –statistic value

The Individual Fully modified OLS in table 4.3 shows there is a positive influence the logW on logL at one percent significant level. For agriculture sector, a 1% increase in nominal wage paid to unskilled labor increases the unskilled employment by 0.23%. For manufacturing sector, a 1% increase in nominal wage paid to unskilled labor increases the unskilled employment by 0.80%. For services sector, a 1% increase in nominal wage paid to unskilled labor increases the unskilled employment by 0.81%. This result consistent with the Performance Based Pay Scheme Theory (PBP), where increasing of wage gives chance for unskilled labor to improve their health condition and motivate more effort in production and create more jobs (Selamah, 2008 & Kon, 2012) in long run.

However, the productivity has significantly negative impact on unskilled labor employment at one percent. For agriculture sector, a 1% increase in output decreases the unskilled employment by 0.27%. For manufacturing sector, a 1% increase in output decreases the unskilled employment by 0.19% and for services sector, a 1% decrease in output by 0.11%. This result suggests unskilled labor will earn more experience and efficiency in production due to specialization in long run. The current experienced unskilled labor tends to produce more without hiring more new unskilled labor (Selamah, 2008). As result, the growth of productivity creates negative effect on the growth of unskilled labor demand. In addition, the theory diminishing of return law also explains why productivity negatively associated with unskilled labor employment.

The logExc and logI significantly associated with the logL in agriculture at one percent but insignificant in manufacturing and services at any significant level. In agriculture sector, a 1% increase in exchange rate decrease the unskilled employment by 0.08% and a 1% increase in interest rate increase the unskilled employment by 1.29%. In agriculture, the increasing of imported input cost (exchange rate) tend to cut unskilled labor employment where it implies that the imported input and unskilled labor input is complement each other (the positive relationship between unskilled labor and imported input). The imported input is likely to decrease skilled labor demand (Vu, 2012) but to produce a higher demand for unskilled worker. The interest rate has positive effect on unskilled labor where the relationship between unskilled labor and capital was substitution input (Rich, 2012) in agriculture. The increasing of interest rate (capital cost) tend to shift from unskilled labor employment to capital employment.

The logFl is positively associated with the logL in agriculture at one percent significant but insignificant for manufacturing and service at any significant level. In agriculture sector, a 1% increase in foreign labor decreases the unskilled employment by 0.74%

This result means that unskilled labor is employed together with foreign labor in agriculture production (complementary input).Since the agriculture creates the highest demand for unskilled labor (Bank Negara Malaysia, 2012), the foreign labors are no longer reduce unskilled labor demand but these inputs are employed together. Finding also indicated that there is no job destruction on unskilled labor in manufacturing and services that created by foreign labor. Chun & Kwon (2011) suggests less skilled labor employment substitute likely to be replace by temporary worker rather than foreign labor.

Table 4.4: Panel Group Fully Modified OLS result.

Variable	LogW	LogQ	LogEXC	LogI	LogFL
Coefficient	0.81***	-0.11***	-0.001	-0.01	0.01
	(59.95)	(-6.48)	(-0.08)	(-0.39)	(0.73)

Note: (***) indicates the rejection of hypothesis null of non-stationary at 1 percent level of significant.

( ) indicates t –statistic value

Table 4.45 shows Panel Group Fully Modified OLS result consistent with the Individual Fully Modified OLS result (except for logExc, logI and logFL in agriculture). The logW is positively associated with the logL at one percent significant. It suggests that 1% increase in nominal wage paid to unskilled labor increases unskilled labor employment by 0.81%. The logQ is negatively influences the logL at one percent significant. It suggests that 1% increase in output decreases

unskilled labor employment by 0.11%. However, the exchange rate, interest rate and foreign labor employment are insignificant associated unskilled labor employment growth at any significant level in panel group result of FMOLS.

CHAPTER 5

DISCUSSION AND CONCLUSION

4.1 Introduction

The FMOLS results suggested different cointegration vectors of the unskilled labor demand across Malaysian sector since this estimation allowing heterogeneity across sectors. This chapter discuss the different result across sectors at section 4.3.

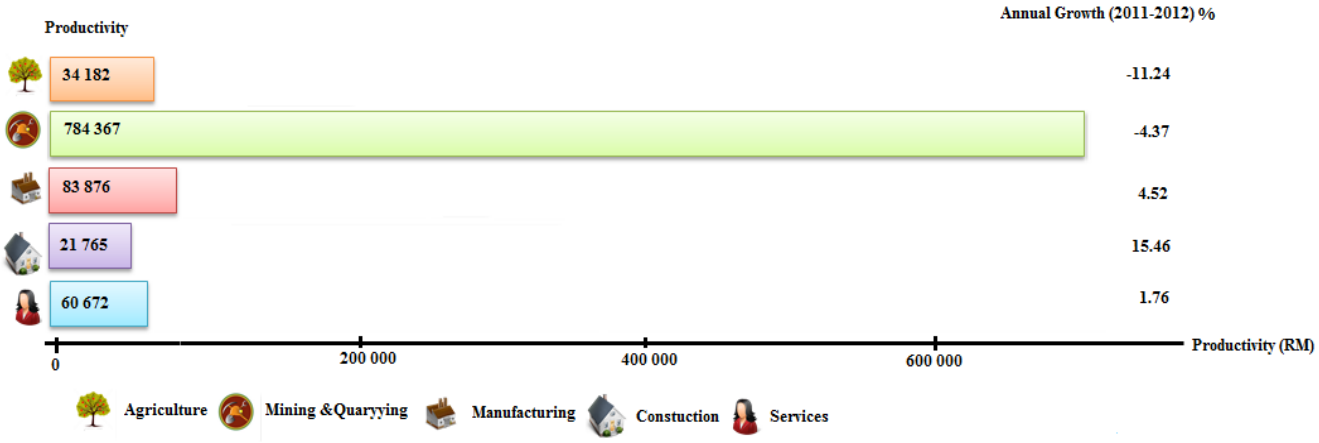
4.2 Discussion

The inelastic of nominal wage with respect to unskilled labor employment shows there are less sensitive of unskilled labor on change in nominal wage for manufacturing, agriculture and services sectors. The adjustment of wage in collective bargaining phenomena (Ho & Yap, 2001) seems to delay the increasing of unskilled labor demand and create wage rigidity in unskilled labor market even in the long run. The agriculture has less sensitivity of unskilled labor demand with respect to change in nominal wage compared to manufacturing and services. In agriculture, the foreign labor employment in palm oil and rubber estate are responsible on why wage is very difficult to increase in long run. In addition, the bumper crop in agriculture requires time to harvest (Bonnie & Gyapong, 2012). The employment of unskilled labor in agriculture tend to increase very slowly due to its production relying on time to harvest even nominal wage is greatly increase. The manufacturing and services sectors have more sensitive unskilled labor employment with respect to nominal wage compared with the agriculture. It explains that these sectors managed switched to labor-saving equipment and technology in production as response to labor shortage (Productivity Report 2012/2013). In 2012, the

manufacturing recorded as the highest mean wage growth (12.2%) amongst Malaysian sectors but the employment growth only increased at 0.25% (the lowest employment growth amongst sectors).

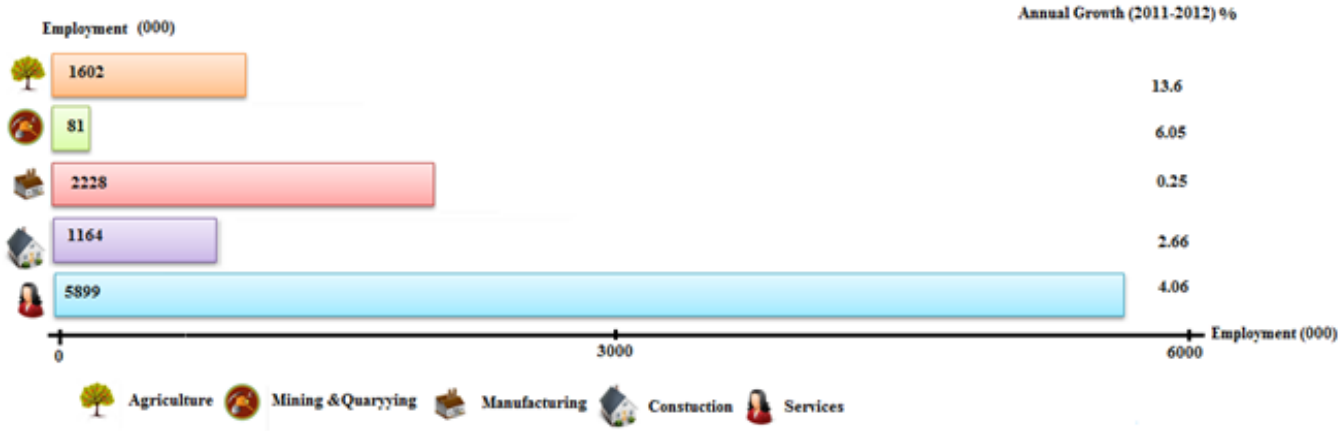
The unskilled employment is suggested to be negative and less responsive with the change of output in agriculture, manufacturing and services sectors. In long run, unskilled labor will earned more experience and skills via training and specialization in production. The current experienced unskilled labor tends to produce more without hiring more new unskilled labor.

Chart 5.1: The Productivity across Malaysian sector and its Annual Growth (2011-2012)



Source: Productivity Report 2012/2013

Chart 5.2: Employment and its Annual Growth by Malaysian sectors (2011-2012)



Source: Productivity Report 2012/2013
Note: the Chart 5.2 shows the total employment (unskilled labor and skilled labor).

The charts 5.1 and 5.2 show the annual growth of employment and productivity across Malaysian sector. The agriculture sector experienced the highest employment growth between other sectors (at 13.6 %) but it also suffered from the lowest productivity growth (at -11.24). This sector encountered with the declining of domestic and external demand of palm oil and product based palm oil even the employment growth of this sector was the highest. The employment growth in manufacturing is 0.25% but its productivity growth is 4.25%. This implied that labor-saving equipment and technology managed to increase the productivity growth even the labor employment is the lowest. The industrial training program seems to be very effective way to enhance labor skills in manufacturing and services sectors. Human Resources Development Fund (HRDF) was launched in 1993 where this organization provides training and skills enhancement for unskilled labor in private sectors. In addition, the Department of Skills Development (DSD) was established by Human Resources Ministry to set up of all public and private training institutes. Through the industrial training and skills upgrading, unskilled labor is likely to give more efforts in production good and services in long run.

In agriculture, the increasing of imported input cost (exchange rate) tend to cut unskilled labor employment where it implies that the imported input and unskilled labor input is complement each other (the positive relationship between unskilled labor and imported input). The imported input is likely to decrease the skilled labor demand (Vu, 2012) but to produce a higher demand for unskilled worker. The interest rate has positive effect on unskilled labor where implies that the relationship between unskilled labor and capital is substitution input (Rich, 2012) in agriculture. The Palm Oil producers quickly switched to machine oriented in production when the labor cost is expected to increase (The Malaysian Insider, 2013) in agriculture. This indicated that the capital is very sensitive to reduce unskilled labor in Agriculture. However, the imported input cost and interest rate have no evidence to influence the unskilled labor employment in manufacturing and agriculture sectors.

The foreign labor employment is appeared to have positive effect on unskilled labor employment but less sensitive (inelastic) in agriculture sectors. However, there is no evidence about the effect of foreign labor employment on unskilled labor employment. There is no job destruction of foreign labor on unskilled labor in agriculture, manufacturing and services. Chun & Kwon (2011) explains less skilled labor employment substitute likely to be replace by temporary worker rather than foreign labor. Since there is less female labor work in production task, the foreign labor also employed along with female labor. This will be the reason why the foreign labor is complement with temporary and female labor rather than unskilled labor in manufacturing sectors. In services, the foreign labor is employed in eleven sub sectors such as restaurant, cleaning services, cargo handling, launderette, caddy in golf club, barber, wholesale/retail, textile, metal/scraps/recycle activities, welfare

homes and hotel/resort island (Malaysian Investment Development Authority, 2014). The Malaysian government always try to limit the foreign labor by rejecting many applications in hiring foreign labor especially from India. As a result, restaurant sector which employed foreign labor from India is suffering from the lack of unskilled labor (BBC News, 2011). In addition, the local -unskilled labor refuses to work in sub-sector like restaurant, cleaning services, metal/scraps/recycle activities and welfare homes (due to the lower payment and long working hours). This can be an explanation on why the foreign labor does not influence unskilled labor in services sector.

Table 5.1: The nationality of foreign labor in the approved Malaysian sector, 2014.

Approved Sectors	Nationals of:
• Manufacturing • Plantation • Agriculture • Construction • Services sector	• Indonesia • Cambodia • Nepal • Myanmar • Laos • Vietnam • Philippines (male only) • Pakistan • Sri Lanka • Thailand • Turkmenistan • Uzbekistan • Kazakhstan
• Services (cooks, wholesale/retail, barber, metal/scraps/ recycle, textile) • Construction (fixing of high voltage cable only) • Agriculture • Plantation	• India

Source: Malaysian Investment Development Authority, 2014

Table 5.1 shows the nationality of foreign labor in the approved Malaysian sectors. The following table shows the India-foreign labor is only allowed to work in some

sub-sector such as cooks, wholesale/retail, barber, metal/scraps/recycle and textile. The local- unskilled labor is less –desire to work in these sub-sectors.

Panel group of FMOLS result in section 4.3 shows the coefficients of panel group in the unskilled labor demand model for manufacturing, services and agriculture sector. It shows that the nominal wage is positively but inelastic (less responsiveness) influencing unskilled labor employment. The stickiness of wage tends to slow down the growth of nominal wage and makes nominal wage less responsive with unskilled labor employment.

The lower wage payment and longer working hours in certain sectors (such as wholesale/retail, metal/scraps/recycle, restaurant and palm oil and rubber estate) are the factors that drive away unskilled labor to participate in labor market. In order to attract the unskilled labor into labor market, producers tend to offer a higher wage and other benefits that will stimulate more unskilled labor employment.

The productivity is suggested to be negatively but less responsive to unskilled labor employment. This implies that unskilled labor become more experienced and trained in long run and reduces the new- unskilled labor hiring (the unskilled labor growth also decline) since the cost of recruiting labor is expensive. The result also suggests that there is no evidence that capital and imported input to associated with unskilled labor employment. Imported input (such as imported machinery and equipment) and capital (such as information technology (IT), and technology) is more to likely to associate with skilled labor.

4.3 Policy Implication

The government always try to control the over-hiring of foreign labor by implementing the foreign workers policy. The over-hiring of foreign labor is caused by illegal foreign labor migration into Malaysia due to the higher wage offering. In response, the Foreign Labor Rationalization Program was executed to overcome this problem. This program gives permission for illegal foreign labor to work in Malaysia and imposing the annual levy to employers whose employed illegal foreign labor.

The foreign labor employment is supporting Malaysian economic growth by overcome the lack of unskilled labor in certain sectors. However, the foreign labor also gives depression on certain sectors like public sectors such as health and education (Economics Report, 2004/2005). The health fee collected from foreign labor is increasing where the cost of providing health service for foreign labor is about RM578 million each year.

The implication of foreign labor on Malaysian economic can be seen from the cash outflow of Balance of Payment, BOP where about RM11, 229 million cash flowed out from Malaysia in 2003 compared to RM 6, 957 million in 1997 (Economics Report, 2004/2005). To overcome this problem, the levy of employing foreign labor was increased from RM 420 in 1992 to RM1, 200 in 1996. It reduced the demand for foreign labor but created lack of labor employment in certain sectors such as restaurant.

The minimum wage policy that included local unskilled labor and foreign labor seems to give benefit to this group. The policy standardized the lowest payments to unskilled labor are RM900 in Peninsular of Malaysia and RM800 at Sabah and Sarawak. In order to overcome the lack of unskilled labor employment, the higher

payment (due to minimum wage policy) attracts unskilled labor to participate in labor market.

4.4 Conclusion

This study found there is evidence that shows the Malaysian unskilled labor demand have long run relationship (cointegrated) with its determinant. This finding answers the objective where there unskilled labor demand is either cointegrated or not. There is less responsiveness (inelastic) of wage in agriculture, manufacturing and services sectors on unskilled labor demand. The relationship between wage and unskilled labor demand is suggested to be positive in long run.

There is less responsiveness of output on unskilled labor in agriculture, manufacturing and services sectors. The relationship between output and unskilled labor demand is suggested to be negative in long run.

There is less responsiveness of exchange rate (imported input cost) on unskilled labor demand in agriculture sector. The relationship between imported input cost and unskilled labor demand is suggested to be negative in long run. However, there is no evidence the long run relationship between imported input cost and unskilled labor demand in manufacturing and services sectors.

There is high responsiveness of interest rate (capital) on unskilled labor demand in agriculture sector. The relationship between interest rate and unskilled labor demand is suggested to be positive in long run. However, there is no evidence the long run relationship between interest rate and unskilled labor demand in manufacturing and services sectors.

There is less responsiveness of foreign labor employment on unskilled labor demand in agriculture sector. The relationship between foreign labor employment and unskilled labor demand is suggested to be negative in long run. However, there is no

evidence the long run relationship between foreign labor employment and unskilled labor demand in manufacturing and services sectors.

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