

# Analysis of wage distribution in Malaysia

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**Abstract.** Labor force demand in Malaysia has grown significantly over the decades since the independence era. Changes in economic structure have led to changes in labor force utilization. There are hundreds of studies had been done to investigate the determinants of wages, including human capital factor, demographic factor as well as job characteristic. The objective of this paper is to examine the determinant of wages in Malaysia using the Salaries and Wages Survey, 2016 conducted by the Department of Statistics Malaysia. Based on the analysis of mean differences, the average wage is significantly different for all variables, including age, ethnicity, marital status, education level and occupation. Even in the analysis of the distribution for men and women, the difference in average wage is also identified for each occupation category and sector of the industry.

**Keywords:** Wage distribution; gender differential; occupation category; sector of industry.

## 1. Introduction

Agricultural activity is the economic basis of almost the entire country in the world. However, the explosive industrial revolution at the end of the 18<sup>th</sup> and early 19<sup>th</sup> centuries has brought a change in the world's economic landscape due to the development of the industrial, manufacturing and transportation sector. Since the era of independence, Malaysia has undergone several phases of significant change in economic structure. In the colonial era until the early phase of independence, the Malayan economy relied on agricultural commodities as a major source of economic growth. But this economic structure has rapidly changed as it is now driven by the dependence on knowledge and the development of information and communications technology. In the 1960's, agriculture-based activities dominated 70 percent of the country's economy. Currently, the agriculture sector represents only 12%, while the services sector is the main economic activity of the country with a contribution of 61% (Mohammed & Sharifah Nabilah, 2018).

In line with economic development, the labor market structure in Malaysia has also undergone a change especially in terms of the composition of employment. Changing the focus of development from an agriculture-based country to an industrialized country has encouraged further economic growth to provide large employment opportunities, especially in industrial fields. Therefore, the development of a country that has been involved in economic change has brought a lot of changes to the pattern of women's involvement in economic activity (Nor Aini, Madeline and Faridah, 1996). Malaysia is experiencing increased labor income share, in contrast to the globed of declining labor income share (Allen, Gen & Theng, 2018).



Based on past studies conducted, this phenomenon is triggered by a number of key factors including changes in economic structure and technological developments (Nik Azma, Ismail & Yussuf, 2011). Malaysia's sustained economic growth over the past three decades has been matched by a narrowing of gender gaps in education enrolment and literacy and increase women labor force participation. After the implementation of the NEP has brought women labor growth more rapidly than a man with 49.3 percent compared to 38.3 percent for men (Schafgans, 2000). The past 10<sup>th</sup> Malaysia Plan has targeted the involvement of women labor force to 55 percent by 2015.

Malaysia's labor force increase by 2.0 percent in 2017 to 15.0 million people as compared to 2016 and the unemployment rate remained at 3.4 percent (Department of Statistic Malaysia, 2018). Table 1 shows the number of monthly salaries and wages recipients is 8.7 million in 2017 compared to 8.4 million in 2016.

**Table 1:** Number of salaries & wages recipients by gender and strata (Malaysian), 2013-2017

Category	Year ('000)				
	Salaries and Wages Survey				
	2013	2014	2015	2016	2017
<b>Total</b>	<b>7,903.10</b>	<b>8,392.40</b>	<b>8,348.60</b>	<b>8,424.10</b>	<b>8,664.70</b>
<b>Gender</b>					
Male	4,784.20	5,070.70	5,049.40	5,034.40	5,143.80
Female	3,118.90	3,321.80	3,299.20	3,389.70	3,520.90
<b>Strata</b>					
Urban	6,202.40	6,937.10	6,788.00	6,964.70	7,288.30
Rural	1,700.70	1,455.30	1,560.60	1,459.40	1,376.40

Source: Department of Statistics, Malaysia

This paper aims to analyze the factors determining wages of workers in Malaysia in three aspects, which are human capital variable, demographic factor, occupation category and sector of the industry.

## 2. Literature Review

There are numerous perspectives to explain wage determinants including the emphasis on personal characteristics, demography factor, and job and labor market characteristic. Based on theories from several scholars, Gottvald, Rievajova & Sipikalova (2013) agreed that wages were commonly determined by personal characteristics, job characteristics, institutional and market characteristics. Mincer's wage function based on human capital theory states that wage differentials could be explained by the ability of humans to generate earnings (Mincer, 1974). Individuals with equal human capital receive the same payment because their productivity is the same. The wages of individuals can also differ because employees differ. Each employee enters the labor market with different human capital aspects including unique capabilities, qualities, and knowledge. This explained that the human capital concept has a positive relationship with productivity.

Many studies have shown that the number of years schooling and human capital factors such as training and working experience plays an important role in determining earnings. Mincer Wage function explained that an employee's wage is determined by the rate of human capital returns. This theory was proven to provide a sufficient description of an individual's income profile in terms of education and experience even in countries with different institutional structures. This theory also in line with Becker (1964) inhuman capital theory that explained people put education as an investment to better income result. Mohd Nor (2012) investigated discrimination in the labor market among public sector and found that years of schooling and working experience have a positive effect on wages. In fact, Mlacha

and Ndanshau (2018) in their research to investigate the relationship between education and labor earning inequalities in Tanzania over 2014 found that education plays an important role that can contribute to determining earning dispersion. They also agreed that education plays a big role in economic.

Budria and Pereira (2007) in a study using data from the Portuguese Labor Force Survey for the period 1998 to 2000 to explore the extent and determinants of training participants. They found that training has an important role in the impact of wages. They stated that training is needed in the firm to improve skills and training with duration of less than a year can also contribute to gain larger wage. Rahmah (2010) also stated that most of the studies examine the determinant of the wage differential concentrate on the role of education and training towards earning and wage differential. In her study about the gender wage differential in Malaysia services sector also found that worker with higher educational levels and who attended skill training receive higher wages. That showed human capital variable has a significant positive effect on wages.

Casper (1998) agreed that there are many factors such as location, gender and occupation that cause gender wage differences. For example, work risk and working environment are different from work. Work in a risk environment leads to higher wages. The theory also supported by Gottvald, Rievajova & Sipikalova (2013) who found that wages are determined by personal characteristics and job characteristics. For example, in Malaysia manufacturing sector, differences in labor earning affected by skills, sex, location and types of industries (Rahmah & Ragayah, 2003). They also found that demand for skilled workers that can cope with more sophisticated technologies were increased due to changes in industrial structure. Blau and Khan (2016) also found that many analyses take into account various factors that explain the variation in wages across gender such as segregation, labor force participation and differences in educational background.

Azam (2012) conducted research to examine the evaluation of wages during 1983 – 2004 across the entire wage distribution by using individual level earning data from urban India. His research was purposely conducted to investigate the effect of human capital variables, demographic characteristic and industry affiliation on earning distribution. He found that the increase in real wages is driven by the increase in prices paid. Therefore, employment discrimination is one of the factors of different wages in the labor market. Muhammad (2013) conducted research to investigate ethnic discrimination among natives and immigrants in England and Wales. His research also investigated the wage determinate for natives, former and later immigrants. He found that the most important wage determinants are language proficiency, education, and age.

Rahayu *et. al.* (2001) identified several factors that affecting pay offered to employees in Malaysia. They stated the tight labor market is a major factor that contributing to the increase in pay among occupations. Rahmah (2010) notes that wage differentials exist between educational level, race, job characteristics, and industry characteristics. These findings are based on a study of 1,136 officers in three selected services sectors, namely information and communication technology (ICT), health and education in Penang, Johor Bahru, Federal Territory and Selangor. She also found that workers in the ICT sector are paid significantly higher followed by the health sector and next educational sector.

Based on neoclassical theory, the marginal productivity of production factor is determinant towards relative's income share (Rahmah and Zulridah, 2005). The marginal productivity wage theory involves a worker being paid for only what they produced. (Allen, Gen & Theng, 2018) summarized that, records from official statistics shown that Malaysia's labor income share has been increasing since 2005, together with improvement in income inequality. Based on their shift-share analysis on the trend of income labor share by economic sector and firm size, they found that two major factor affecting labor income share in Malaysia, which are technological advancement and trade and financial integration.

### 3. Methodology

#### 3.1. Description of Data

Data from Salaries and Wages Survey in 2016 conducted by the Department of Statistics Malaysia is used in this study. Salaries & Wages Survey is one of the modules in the Labour Force Survey (LFS), which is carried out from January until June to provide salaries and wages statistics at the national and state levels as well as urban and rural areas. In this study the dependent variable is a wage while the independent variables are education level, the highest certificate, age, gender, marital status, ethnic group, strata, occupation category and the sector of the industry.

There are 13,089 of respondents in the data set representing 30 percent of the total sample of the survey all over Malaysia. From the total respondents in this study, 7841 (59.9 percent) were men respondents and 5248 were women (40.1 percent) who were scattered by the state as shown in Table 2. The entire respondent in this study is Malaysia citizenship.

**Table 2:** Numbers of Respondent by State

State	Number of Respondents	Percent
Johor	1262	9.6
Kedah	836	6.4
Kelantan	689	5.3
Melaka	815	6.2
N. Sembilan	806	6.2
Pahang	973	7.4
P. Pinang	982	7.5
Perak	906	6.9
Perlis	422	3.2
Selangor	1375	10.5
Terengganu	746	5.7
Sabah	1103	8.4
Sarawak	1127	8.6
F.T Kuala Lumpur	572	4.4
F.T Labuan	233	1.8
F.T Putrajaya	242	1.8

The wage variable is an average of monthly wage in Malaysian Ringgit. Skill levels in occupation category were classified based on Malaysia Standard Classification of Occupation (MASCO) 2013 as follows: Skilled workers – 1. Managers; 2. Professionals; 3. Technicians and associate professionals; Semi-skilled workers – 4. Clerical support workers; 5. Service and sales workers; 6. Skilled agricultural, forestry, livestock and fishery workers; 7. Craft and related trades workers; 8. Plant and machine operators and assemblers; Low-skilled workers – 9. Elementary occupations. Marital status is categorized into two categories, which are married (including divorce, widow and widower) and unmarried. The sector of industry category was classified based on Malaysia Industry Classification (MSIC) 2008 in 5 main sectors.

### 3.2. Statistical Analysis

#### 3.2.1. Normality Test

We used The Kolmogorov-Sminov to run a normality test since sample size,  $n > 50$ . The Kolmogorov-Sminov test assesses whether there is a significant departure from the normality in the population distribution. The distribution of wage is highly skewed and the Kolmogorov-Sminov test for normality assumption is rejected (statistics = 0.189,  $df = 13089$ ,  $p < 0.05$ ). Therefore, the analysis of this study will be used the non-parametric test.

#### 3.2.2. Inferential Statistics

The Mann Whitney Test compares the median for two groups of cases. Ideally, for this test, the subjects should be randomly assigned into two groups, so that any difference in response is due to the treatment and not to the factors.

The Kruskal-Wallis test used to compare the median of more than two independent samples. The Kruskal-Wallis test is usually more powerful and suitable when the data is measured on at least an ordinal scale (ordinal, interval and ratio).

## 4. Result

In this section we began with descriptive analysis followed by inferential analysis. Table 3 shows the result of the descriptive analysis based on occupation category: skilled, semi-skilled and low-skilled.

**Table 3:** Descriptive Analysis Based on Occupation Category

	Occupation Category					
	Skilled		Semi-skilled		Low-skilled	
	n	%	n	%	n	%
Urban	3,622	38.15	5,065	53.36	806	8.49
Rural	871	24.22	2,189	60.87	536	14.91
Men	2,442	31.14	4,463	56.92	936	11.94
Women	2,051	39.08	2,791	53.18	406	7.74
Married	2,796	34.24	4,525	55.41	845	10.35
Unmarried	1,697	34.47	2,729	55.43	497	10.10
Bumiputera	3,407	34.54	5,338	54.11	1,120	11.35
Chinese	798	35.80	1,343	60.25	88	3.95
Indian	272	30.02	520	57.40	114	12.58
Others	16	17.98	53	59.55	20	22.47
No Education	2	1.50	69	51.88	62	46.62
Primary	39	4.11	635	66.98	274	28.90
Secondary	1,084	14.67	5,357	72.50	948	12.83
Tertiari	3,368	72.92	1,193	25.83	58	1.26

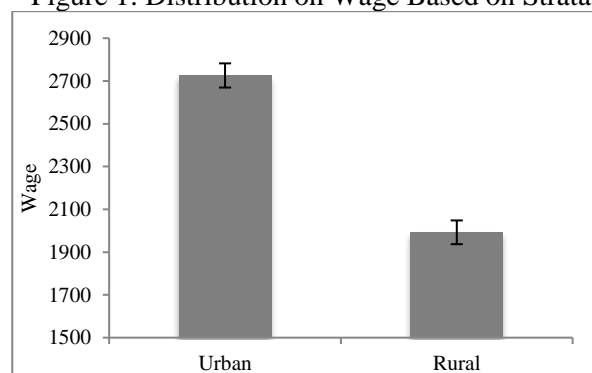
The numbers of men workers are higher than women workers by 59.90 per cent, which can be seen in all occupation categories that are skilled, semi-skilled and low-skilled. The numbers of workers in urban areas are also higher than rural areas for all occupation categories with 72.52 percent. Data also showed that 62.39 per cent of the workers are married and Bumiputera ethnic dominated the composition of the ethnic distribution of workers by 75.37 per cent. The number of semi-skilled workers dominated each ethnic composition with an overall percentage of 55.42 percent compared to skilled and low-skilled workers. The percentage of respondents with secondary education is higher than other categories with 56.17 percent and most of them are semi-skilled workers with 72.50 percent.

**Table 4:** Mean Difference

	Mean	Std Deviation
Gender*		
Men	2597.07	2517.00
Women	2411.34	2040.12
Strata*		
Urban	2725.83	2492.85
Rural	1992.54	1700.54
Marital Status		
Married	2524.77	2366.72
Unmarried	2522.88	2256.01
Ethnic Group*		
Bumiputera	2474.23	2279.90
Chinese	2873.76	2527.35
Indian	2299.42	2288.33
Others	1620.75	1198.90
Education Level*		
No Education	1062.15	461.21
Primary	1395.62	991.92
Secondary	1840.96	1304.50
Tertiary	3891.37	3075.41

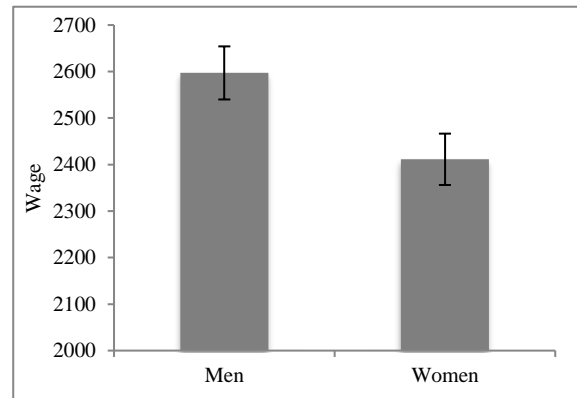
Note: \*significant at 5% of the significance level ( $\alpha=0.05$ ).

Based on the Mann-Whitney Test shows that the difference in wage between urban ( $Mdn = 2000$ ) and rural ( $Mdn 1400$ ) is statistically significant at  $\alpha = 0.05$ . Figure 1 shows that on average, workers in the urban area paid higher than workers in rural area.

**Figure 1:** Distribution on Wage Based on Strata

There are also has significantly difference in wage between men ( $Mdn = 1800$ ) and women ( $Mdn = 1680$ ), at  $\alpha = 0.05$ . Figure 2 shows that wage difference is significant ( $p < 0.05$ ) which is men workers paid higher than women workers.

Figure 2: Distribution on Wage Based on Gender



Based on the Kruskal-Wallis Test, it proves that wage is significantly distributed differently among ethnic groups,  $H(3)=197.36$ ,  $p < 0.05$ . Pairwise comparison with adjusted  $p$ -values shows that there is a significant difference between wage for each ethnic group where  $p < 0.05$ . Figure 3 shows Chinese workers paid higher compared to the rest of ethnic groups and other ethnic workers are the least paid.

Figure 3: Distribution on Wage Based on Ethnic Group

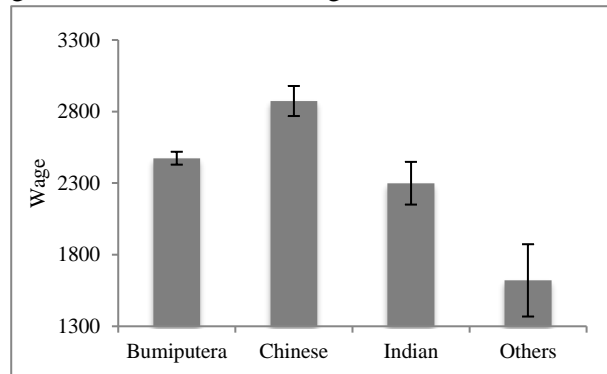
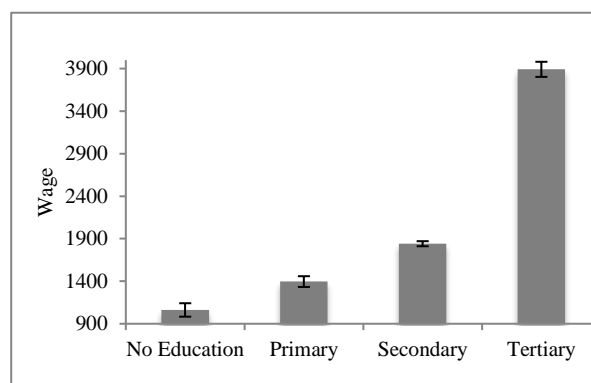


Figure 4: Distribution on Wage Based on Education Level



Wage also significantly distributed differently among education levels,  $H(3)=3842.654$ ,  $p < 0.05$ . Pairwise comparison with adjusted  $p$ -values shows that there is a significant difference between wage of different level of education, where  $p < 0.05$ . Workers with tertiary education paid the highest followed by secondary education level, primary education level and worker without any formal education the least paid.

Wage significantly distributed differently among occupation category,  $H(2)=4827.12$ ,  $p < 0.05$ . Pairwise comparison with adjusted  $p$ -values shows that there is a significant difference between wage and each occupation category where  $p < 0.05$ .

Then, the Kruskal-Wallis Test also shows that wage significantly distributed differently across the sector of industry,  $H(4)=516.95$ ,  $p < 0.05$ . Pairwise comparison with adjusted  $p$ -values shows that there is a significant difference between wage and each sector of the industry where  $p < 0.05$ .

**Table 5:** Means of Wage Based on Occupation Category

Occupation Category	Men		Women	
	Mean	Std. Deviation	Mean	Std. Deviation
Skilled	4343.37	3515.17	3845.31	2430.93
Semi-skilled	1820.40	1199.25	1528.92	946.35
Low-skilled	1395.90	726.44	1005.65	464.90

**Table 6:** Means of Wage Based on Sector of Industry

Sector of Industry	Men		Women	
	Mean	Std. Deviation	Mean	Std. Deviation
Agriculture	1499.83	1180.96	1376.98	874.98
Mining and Quarriying	4360.28	4759.51	3732.28	2357.37
Manufacturing	2279.80	2246.16	1661.57	1208.85
Construction	1856.77	1486.43	1924.54	1575.70
Services	2768.87	2588.69	2562.53	2154.40

Tables 5 and 6 show that the overall average wage of men workers is higher than women workers with figures of 2555.48 compared to 2393.72 either based on the occupation category or sector of industry. The average wage among men workers is higher than women workers in all the occupation categories that are skilled, semi-skilled and low-skilled. However, for the sector of industry, women workers in the construction sector receive a higher wage than men workers with 1924.54 compared to 1856.77.

## 5. Discussion and Conclusion

Overall, the data from Salaries and Wages Survey, 2016 reveal that wage differentials exist between strata, gender, education levels, ethnic group, occupation category and sector of the industry. This finding is in line with previous studies from Rahmah and Zulridah (2005) who found that education levels, races, job characteristics, and industry characteristics were factors that contributed to wage differences. An example, both studies found that Chinese workers had been paid higher compared to other ethnic groups. A study by Rahmah and Ragayah (2003) also concluded that human capital variables including skill are the main factor determining earnings differential compare other variables such as location.

Wage differentials among occupation category that has been found in this study also in line with Nik, Rahmah and Ishak (2011) that found 64.25 percent wages differentials between skilled workers and semi-skilled workers and 77.20 percent between skilled workers and low-skilled workers. However,

past studies also suggested that human capital variables especially training and working experience are important factors prevail wage differentials.

Based on the analysis of the distribution for men and women, the difference in average wage is also identified for each occupation category and sector of the industry. Women have lower average wage rates than men for skilled, semi skilled and low-skilled workers in all sectors of the industry except construction. However, the results of this study are based on an analysis of unweighted data. In a future study, analysis based on weighted data should be considered to see if there is any difference in the wage distribution.

In the case of complex survey involving stratification in this study, weighted statistical methods can be implement as tools to minimize sampling error and thus make the estimation process more accurate for a population (Ciol MA *et. al.*, 2006). Korn and Graubard (1995) used vital records corresponding to live births, late fetal deaths, and infant deaths in 1988 in the United States from the 1988 National Maternal and Infant Health Survey. They summarize that weights make a difference in the analysis, they more commonly affect estimates of population means rather than estimates of association.

Several other factors should also be taken into account in future studies such as years of schooling, working experience, training, and other human capital factor.

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