



AN ANALYSIS OF THE PERSISTENCE OF WAGE DIFFERENTIALS IN MALAYSIA

Malissa Ali^{a,b*}, Zarinah Hamid^{a,c}, Zera Zuryana Idris^{a,d}, Shabir Ahmad Hakim^e, and Dolhadi Zainudin^f

^a*Department of Economics, Faculty of Economics and Management Sciences, 53100 International Islamic University Malaysia, Malaysia. (Email: ^bmalissaali@outlook.com, ^cinahumkc@iium.edu.my, ^dzerazuryana@iium.edu.my)*

^e*Bath Spa University, Ras Al Khaimah, United Arab Emirates. (Email: shabir@bathspa.ae)*

^f*Department of Business Administration, Faculty of Economics and Management Sciences, 53100 International Islamic University Malaysia, Malaysia. (Email: dolhadi@iium.edu.my)*

ABSTRACT

Studies on the labor market wage gap have been published across nations with different variables of interest because inequality in labor compensation is a severe socioeconomic problem. Income inequality is studied through the wage gap Blinder-Oaxaca Decomposition method to investigate the contributing factors to the wage differential. As per previous studies, the factors were classified into endowments, coefficients, and interaction parts. Endowments capture the disparity in productivity or observable characteristics that may define the wage gap, the coefficient part is the wage structure built from discrimination or unobservable characteristics, and interaction is the component of how the other two interact with each other. Our study uses data from the Household Income Survey (HIS) conducted by the Department of Statistics Malaysia (DOSM) in 2022, 2019, and 2016. The total sample size is 35,884 observations (of which 12,735 are for the year 2022; 11,698 for 2019; and 11,451 for 2016). Findings show that the wage difference between Bumiputera and non-Bumiputera was reduced from 2016 to 2019. It increased again in 2022, however, higher than in 2016. The three-year mean for endowment effects is

39.55% of the wage difference and 60.45% for coefficient and interaction parts combined. Therefore, it is statistically evident that Bumiputera labor is compensated lower than non-Bumiputera. This study gives recent insights on the ethnic wage differentials with more updated datasets and identifies the determinants of wage differential which would help policymakers to tackle the root causes.

JEL Classification: C02, J24, J31, J710

Keywords: Wage gap, Oaxaca-Blinder, Bumiputera, Labor, Discrimination

Submitted: 27/08/2024 Accepted: 04/11/2024 Published: 28/12/2025

1. INTRODUCTION

Malaysia is a multiracial country and home to many races, with citizens categorized into two groups: Bumiputera, the term for Malays and other aborigines, and non-Bumiputera, the Chinese, Indian, and other ethnicities. The division of population as of 2022 shows that 64.7% of the population is Bumiputera, 27.2% are non-Bumiputera, and the rest are from different ethnicities or expats (Department of Statistics Malaysia, 2023). The Bumiputera comprise 57.5% of the labor force, while the Chinese and Indian portions are around 21.5% and 6.26%, respectively, as of 2022 (Economic Planning Unit, Prime Minister's Department, 2022). Bumiputera is the group of interest in this paper because, as the majority, they have a significant weightage in deriving findings and conclusions in the wage gap study.

The history of earning discrimination in Malaysia can be traced back to British colonialism, when the divide-and-rule policy was implemented. Malays became the most disadvantaged race, affected by the prohibition of being involved in lucrative businesses. The Chinese earned more as merchants, and Malays earned the least as poor farmers and fishermen (Yaakub et al., 2022). We hypothesized that Bumiputera was the discriminated group in this study due to its economic disadvantage in the past, which is still persistent in time following the effect of human capital accumulation, evidently supported by the government's incessant effort to improve productivity skills of Bumiputera. One of the Malaysian government's policies to tackle the issue was implementing the New Economic Policy (NEP) in 1971 to attract Bumiputera participation in the critical economic sectors. In the 1990s, the National Development Policy (NDP) targeted Bumiputera to participate in skill, training, and

education while giving them financial aid. Several government agencies were set up to specialize in helping this disadvantaged group, such as the National Entrepreneurial Group Economic Fund (TEKUN), to provide monetary assistance to Small and Medium Enterprises (SMEs) to help alleviate the Bumiputera from economic hardship by funding micro businesses and fostering employment. This paper examines wage discrimination as a critical issue for two reasons. First, wages significantly determine labor pricing and its supply-demand equilibrium. Second, economic development should be improved with better wages. As of 2022, Bumiputera is still the majority poor group in Malaysia because of household economic activities and geolocation (Hussain, 2020). This paper investigates whether the wage gap between these two groups is still persistent from the previous similar study, and what predictors explain the differences. This paper hypothesizes that Bumiputera workers earned less than non-Bumiputera, and coefficient and interaction significantly impact the wage.

This paper is organized as follows: Section 1 gives the background and motivation of the study. Section 2 outlines a literature review that covers the economic models and theories, and research published in other countries' labor markets. Section 3 explains the methodology and the variable list. Section 4 discusses the results and empirical results, and Section 5 concludes with policy recommendations and suggestions for future research.

2. LITERATURE REVIEW

2.1 ECONOMIC MODELS AND UNDERLYING THEORIES

Taste for Discrimination theory explained employers' aversion toward a group characterized by non-productive differences from a similarly capable group regarding skills and productivity. The employer would then have the impression that hiring a discriminated group involves more cost, which is unreasonable because the cost is built upon their perception, unrelated to the business's profit, such as skin colour, gender, and race.

Then, the emergence of Theory of Human Capital in the 1960s, stated that investment in human capital, such as education and on-the-job training, would improve productivity, reflecting economic growth and development (Schultz, 1961). From then on, formal education has been the starting point for explaining the differences in income earning. The importance of education is reflected in government policy; for example, the Malaysian government spent

16.4% of its total expenditure on education in 2021 (World Bank Open Data). A separate study in the United States showed that the state-level wage gaps and actual gross domestic product per worker resulted in a significant inverse relationship, which means the higher the GDP per worker produced, the lower the wage gap. Nevertheless, they are not attributable to the government spending on education and capital investment (Gramozi, Theodore, and Marios, 2023). Because education and capital investment could not explain the wage difference, other factors may cause taste-based discrimination (Gramozi, et al., 2023). This means the Human Capital model cannot fully explain the macroeconomic implications of wage differential when education and human capital investment cannot explain the underlying reasons. An important takeaway from this study is that authors interlinked the discrimination with macroeconomic variables to show the monetary cost to the nation, making this research topic relevant because not only does discrimination affect the labor force and their well-being, but employers and the national income are affected as well.

Next, Mincer's Earning Equation explained the positive correlation between the three and could empirically be proved with the Mincer Earning Function (Mincer, 1974). However, these two variables are inconclusive enough to explain income differences between labor with identical productivity portfolios. Income inequality is an economic problem happening worldwide, with different countries having a different nature of labor market discrimination. A study with Brazilian labor market data showed that employers favor their workers based on their skin color, which is closely defined by their race and gender. The non-white population's discriminatory wage is below that of white laborers (Faustino et al., 2023). Another critical point in this study was a government initiative to boost employment called transfer policies, which aimed at more inclusivity toward the lower class by increasing their employment (Faustino et al., 2023). Economically Active Population (EAP) is the term used for people who are working or actively looking for employment. The EAP group surprisingly fell from 2004 to 2014 despite the transfer policies being adopted especially in the wealthier regions where the population was more educated (Faustino et al., 2023). Labor market discrimination acted as a disincentive for them to be part of EAP because of unfair competition, even with peers of similar productive characteristics. Without proactive countermeasures to fight employment bias, the expenditure would yield either less or the opposite result than intended.

2.2 WAGE GAP STUDIES IN OTHER COUNTRIES

The study of discrimination in the labor market was initiated in 1957, which led to several subsequent economic analyses of wage differential, adapted to different geographical and demographical settings up to recent years. Based on the wage gap studies conducted in other countries, understanding the labor market's legal, historical, and demographical nature is essential to understand the underlying discrimination. For example, in Indonesia, while it is true that educational attainment improved the wage gap at a diminishing rate, the legality concerning the wage system and health, safety, and environmental (HSE) regulations widened the gap more than it was narrowed (Santoso et al., 2022). In China, a study was conducted on the mean wage of workers in the extractive and production energy industry, proving that the public sector was getting paid higher than the private sector. The wage gap persisted from 2003 to 2014, with a decreasing statistical discrimination rate from 30% to 18%. This study used gender, educational attainment, and working experience as controlled factors. Only a small proportion of the gap could be explained by them, however, which means other non-productive characteristics contribute to the unexplained discrimination (Li, Tu, and Zhang, 2022).

In Malaysia, the Chinese earn more than the Malays and the Indians, and the ratio is approximately 0.57 for Malay/Chinese and 0.81 for Indian/Chinese (Borjas, 2016). Sector-specific wage differential research revealed that in the Malaysia manufacturing sector, Chinese workers were significantly earning higher wages than Malay workers, but not significant when comparing between Indian and Malay (Ismail and Noor, 2013). A variable that contributed the highest to the unexplained portion of the wage gap is demographic characteristic which signified the underlying discrimination practice in 1991 (Ismail and Noor, 2013).

Government intervention in improving productivity was reviewed, since the counterfactual to the labor discrimination is the discrepancy in the labor productivity between two groups. In Malaysia, despite making up 65.8% of the labor market, Bumiputera was the 'minority' or discriminated against in terms of wage differential (Department of Statistics Malaysia, 2022). The New Economic Policy (NEP) managed to close the gap by increasing Malay wages. Data from 1976 to 1991, however, showed that the gap grew and persisted after 1986, from RM 298 to RM 643.10 (Shahiri, 2012). Five decades ago, workers with a Lower Certificate of Education

(PMR) were more likely to be recruited for white-collar jobs than workers who did not attend school or finished schooling at a lower secondary level (Hirschman, 1983). In a separate study that investigated the discrimination in the Malaysia labor market between men and women workers in 1988, when only human capital variables were included in the decomposition, 87% of the wage differential stemmed from the gap of productive characteristics (Mohd Nor, 2013). Inclusion of family institution variables, however, increased the discrimination component to 89%, with men benefitted about 11% on productive advantage over women (Mohd Nor, 2013). To overcome the advantage enjoyed by men, women needed to attain better human capital quality, such as a higher level of education. These findings are aligned with an earlier research by Mohd Nor (2013), showing that in 1988, the women's wages were reported lower than men at 59%; improving the productivity traits will fix only small portions as 50% rooted in omitted variables.

At the macro level, the labor productivity does depend on the human capital variables such as education and health. Among all education levels, only secondary and tertiary were statistically significant and their impacts are positive on the labor productivity because Malaysia is a middle-income economy with mostly secondary education levels (Arshad and Malik, 2015). Increasing life expectancy contributed to an increment of labor productivity by 14 percent, *ceteris paribus* (Arshad and Malik, 2015). Meanwhile in another study between the Organization of Islamic Cooperation (OIC) countries, investment from the high-income countries would greatly boost the GDP growth in low-income countries with better infrastructure and creation of business and employment (Yusuf and Zainuddin, 2011). This is because in developing economies, jobs were mostly informal and exposed to discrimination in terms of legal and social protection (Yusuf and Zainuddin, 2011). Arshad and Malik (2015) as well as Yusuf and Zainuddin (2011) emphasized the importance of human capital factors as determinants for labor productivity improvement.

Malaysian citizens were also discriminated against with regard to wage differential when taking immigrant workers into account. A study by Abdullah, Theodossiou, and Zangelidis (2020) found that the wage gap between natives and immigrants in Malaysia could be explained mainly through productivity skills. The unexplained portion of the wage gap by other unobservable variables accounted for a 15.4% increment in the native's wage and a 13.3% decrement in the

immigrant's salary. Low-skilled foreign workers in the plantation sector are favored by employers with a striking difference of 33 percentage points higher than native workers (Shahiri, Cheng, and Al-Hadi, 2021a). Realizing the existence of wage differential, native workers entered the employment without the intention to stay on the job long term. Among Indonesian, Indian, and Malaysian (others), Indians earned the least, and Indonesians earned the most. Employers disguised their payment practices for productivity reasons; but employers assign more jobs to them because employers favor Indonesian workers (Shahiri et al., 2021a). This gave foreigners more experience, practice, and skill and they appeared more productive than Malaysian workers.

This paper will use more recent data to investigate if the wage gap between non-Bumiputera and Bumiputera is a current issue or if it has been resolved. Bumiputera comprises a majority of the total labor market hence their economic hardships substantially affect Malaysia's economic growth and development, making continual research and policy proposals crucial.

3. METHODOLOGY AND DATA

3.1 DATA

The Department of Statistics Malaysia supplied the data through the Household Income Survey (HIS) conducted in 2016, 2019, and 2022. The samples are from private workers in Malaysia, excluding government workers, because public employers are already subjected to a fixed wage structure. This data would then be analyzed using the Blinder-Oaxaca Decomposition method with Stata software. This method breaks down the wage difference to observable and unobservable attributes. Table 1 below lists all variables used in this study with descriptions. As per previous research on a similar topic Li et al. (2022) and Faustino et al. (2023), educational attainment, marital status, gender, demographic, and geographic characteristics variables are chosen. Meanwhile, other income variables were chosen based on the labor supply and income effect theory that says non-employment income would make labor supply less working hours and accept lower wages to have more leisure for utility maximization (Borjas, 2016).

TABLE 1
List of Variables and Explanation

Variables	Explanation
ethnic_dummy	Dummy variable for ethnic (1 for non-Bumiputera and 0 for otherwise)
lnINCS01_hh	Log of annual household employment income (in MYR). Proxy for wage of HOH and the dependent variable of this study.
strata_dummy	Dummy variable for strata (1 for Urban, and 0 for otherwise)
region_dummy	Dummy variable for the region (1 for Peninsular Malaysia, 0 for otherwise)
hh_size	Household size
hoh_gen	Dummy variable for gender of head of household (HOH) (1 for male; 0 for otherwise)
hoh_age	Age of the HOH
hoh_agesq	Age square. Proxy variable for working tenure.
hoh_marital_dummy	Dummy variable for the marital status of HOH (1 for Not Married, 0 for otherwise)
hoh_no_cert	Dummy variable for no certification as the highest educational attained by HOH (1 for no certificate, 0 for otherwise)
hoh_pmr	Dummy variable for PMR as the highest educational attained by HOH (1 for PMR, 0 for otherwise). PMR is equivalent to Lower Secondary Assessment.
hoh_spm	Dummy variable for SPM (or equivalent) as the highest educational attained by the HOH (1 for SPM, 0 for otherwise). SPM is the O-level equivalent.
hoh_dip	Dummy variable for diploma (or equivalent) as the highest educational attained by the HOH (1 for diploma, 0 otherwise)
hoh_bachelor	Dummy variable for a bachelor's degree and above (or equivalent) as the highest education attained by the HOH (1 for Bachelor's degree and above, 0 for otherwise)
hoh_prof	Dummy variable for the professional occupation of the HOH (1 for professional worker, 0 for otherwise)
lnINCS02_hh	Log of other earned income annually (in MYR)

*The STPM-holder or A-level equivalent is the reference group for educational attainment dummy variables.

3.2 WAGE EQUATIONS FOR TWO GROUPS

Samples are divided into two groups; Group nb comprises workers of non-Bumiputera (Chinese, Indian, and Others), Group b includes Bumiputera workers, the outcome variable Y , the log of HOH's wage proxy variable, and a set of predictors. This method aims at decomposing the mean wage between n and nb . The wage model here is assumed to be in a linear functional form (Cahuc, Carcillo, and Zylberberg, 2014).

$$(1) \quad \ln Y_{nb,i} = \mathbf{x}_{nb,i} \boldsymbol{\beta}_{nb} + \varepsilon_{nb,i}$$

The equation above is for the non-Bumiputera workers group. $Y_{nb,i}$ is the log of HOH's wage proxy of individual i from nb group. $x_{nb,i}$ is the vector of observable predictors of individual i from nb group. β_{nb} are the vector coefficients to be estimated. $\varepsilon_{nb,i}$ is the error term, assumed to be normally distributed with zero means.

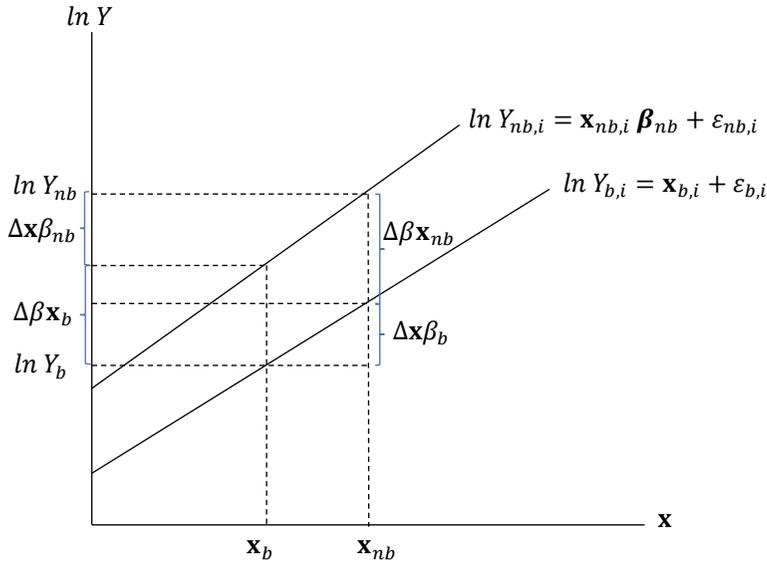
The equation for Bumiputera workers is constructed similarly:

$$(2) \quad \ln Y_{b,i} = \mathbf{x}_{bi} \boldsymbol{\beta}_b + \varepsilon_{b,i}$$

The hypothesized discriminated group would have a better regression line than the other group (O'Donnell, Doorslaer, Wagstaff, and Lindelow, 2008). This means that for every value in the vector x , the outcome $\ln Y_i$ will be relatively better for Group nb than Group b .

Based on Figure 1, the wage equation for Bumiputera workers lies below that for non-Bumiputera workers. The x_{nb} leads to a higher value of $\ln Y_{nb}$ than x_b does for $\ln Y_b$. The difference of Δx is the explained wage gap weighted by their respective coefficients, $\Delta x \beta_{nb}$ and $\Delta x \beta_b$ determined by the observed productivity features of the two groups. In comparison, $\Delta \beta$ is the coefficient difference weighted by the observed predictors, $\Delta \beta x_{nb}$ and $\Delta \beta x_b$. This part shows the difference in $\ln Y_i$ given the same x_i .

FIGURE 1
Wage Decomposition



3.3 THE BLINDER-OAXACA METHOD: THE BASIC TWO-FOLD DECOMPOSITION

Now, we must calculate the difference between the log of HOH’s wage proxy between two groups, using $\Delta = E(Y_{nb}) - E(Y_b)$, resulting in:

$$(3) \quad \Delta = \mathbb{E}(x_{nb}) \beta_{nb} + \mathbb{E}(\epsilon_{nb}) - \mathbb{E}(x_b) \beta_b - \mathbb{E}(\epsilon_b)$$

From assumption $E(\epsilon_{nb}) = E(\epsilon_b) = 0$, we obtained:

$$(4) \quad \Delta = \mathbb{E}(x_{nb}) \beta_{nb} - \mathbb{E}(x_b) \beta_b$$

Replace equation 4 with the expected values of covariates of the respective group mean; the estimated equation for the model is:

$$(5) \quad \hat{\Delta} = \bar{x}_{nb} \hat{\beta}_{nb} - \bar{x}_b \hat{\beta}_b$$

Lastly, we add and subtract the average counterfactual wage that Bumiputera workers would earn if they have the non-Bumiputera workers' wage structure into the equation 5, we get:

$$(6) \quad \overline{\ln Y_{nb}} - \overline{\ln Y_b} = (\bar{x}_{nb} - \bar{x}_b) \hat{\beta}_{nb} + \bar{x}_b (\hat{\beta}_{nb} - \hat{\beta}_b)$$

There are two components in equation 6, first, $(\bar{x}_{nb} - \bar{x}_b) \hat{\beta}_{nb}$ is the composition effect, or the “explained” portion of the decomposition. It comprises the wage differences due to observed characteristics such as education attainment and age. Second, the “unexplained” portion, $\bar{x}_b (\hat{\beta}_{nb} - \hat{\beta}_b)$, is the wage structure effect, and it measures the change of the wage paid to Bumiputera workers' if they have the same characteristics of non-Bumiputera workers have. The basic decomposition is also known as the two-fold decomposition. Next, we will look at the three-fold decomposition.

3.4 THE BLINDER-OAXACA METHOD: THE THREEFOLD DECOMPOSITION

We used the threefold Blinder-Oaxaca decomposition technique to decompose the difference in the log average wage into three parts: the Endowment Effect (*E*), the Coefficient Effect (*C*), and the Interaction Effect (*I*) (Jann, 2008). We are interested to know the mean difference of *Y* of those two groups,

$$(7) \quad R = \mathbb{E}(\ln Y_{nb}) - \mathbb{E}(\ln Y_b)$$

Take the linear model,

$$(8) \quad \ln Y_i = \mathbf{x}'_i \beta_i + \epsilon_i, \mathbb{E}(\epsilon_i) = 0, i \in \{nb, b\}$$

x is the vector with observed predictors, *β* has the slope parameters and the intercept, and ϵ_i is the error that includes all unobserved and excluded variables.

Adapting the equation 8 into 7, we have,

$$(9) \quad R = \mathbb{E}(Y_{nb}) - \mathbb{E}(Y_b) = \mathbb{E}(\mathbf{x}_{nb})' \beta_{nb} - \mathbb{E}(\mathbf{x}_b)' \beta_b$$

Since

$$(10) \quad \mathbb{E}(Y_i) = \mathbb{E}(\mathbf{x}'_i \beta_i + \epsilon_i) = \mathbb{E}(\mathbf{x}'_i \beta_i) + \mathbb{E}(\epsilon_i) = \mathbb{E}(\mathbf{x}_i)' \beta_i$$

We assume, $E(\beta_i) = \beta_i$ and $E(\epsilon_i) = 0$.

Now, we need to find how the predictors contribute to the wage gap, and we rearrange equation 9 as such:

$$(11) \quad R = [\mathbb{E}(x_{nb}) - \mathbb{E}(x_b)]' \beta_b + \mathbb{E}(x_b)' (\beta_{nb} - \beta_b) + [\mathbb{E}(x_{nb}) - \mathbb{E}(x_b)]' (\beta_{nb} - \beta_b)$$

The equation 11 is the three-fold decomposition, summarised as:

$$R = E + C + I$$

First summand, Endowment Effect (E): $[E(x_{nb}) - E(x_b)]' \beta_b$

This part showed how much the observed characteristics contribute to the wage gap. It tells us the expected change in Bumiputera workers' wages if they have non-Bumiputera predictor levels. For example, the value informs us that if Bumiputera has the same educational attainment as the non-Bumiputera, what would be Bumiputera's wage change?

Second summand, Coefficient Effect, (C): $E(x_b)' (\beta_{nb} - \beta_b)$

This shows the differences in the coefficients weighted by non-Bumiputera predictor levels. This part tells us the change in Bumiputera's wage if they have the coefficients belonging to the non-Bumiputera group.

Third summand, Interaction Effect, (I): $[E(x_{nb}) - E(x_b)]' (\beta_{nb} - \beta_b)$

The last summand contains the part when C and E happens simultaneously between Bumiputera and non-Bumiputera.

4. EMPIRICAL RESULT

4.1 DESCRIPTIVE DATA AND SAMPLE CHARACTERISTICS

The study uses the 2016, 2019, and 2022 Household Income Survey (HIS) data collected by the Department of Statistics Malaysia (DOSM). The data utilized for this study are categorized into household information, personal individual characteristics, and productivity characteristics of the heads of households (HOH).

Household information collected includes the size, ethnic membership, demographic and geographic characteristics, whether they are located in urban or otherwise and Peninsular Malaysia or otherwise, other household income than the employment source, and the dependent variable, the household paid income. The household-paid income is a proxy of the wage earned by the HOH, assuming the wage earned by the HOH is the household's primary income and the HOH is the primary wage contributor for the households, as is the case for conventional households.

The personal individual characteristics of the HOH are gender, marital status, and economic activities; they must be in the private sector and whether they are working as a professional.

The productivity characteristics of the HOH are their age, age squared as the proxy of working experience tenure, and the highest level of educational attainment since their working tenure information is unavailable from this dataset. Age squared as the proxy was acknowledged in David Card's writing in the *Handbook of Labour Economics* (1999).

Heckman's two-step method to remove selection bias is unnecessary in this research because there is no variation in the paid employment income because other employment statuses were excluded. Other activity statuses that were excluded: those HOHs who are employers themselves, government employees, registered and unregistered self-employed, unpaid family workers, unemployed, housewives, students, pensioners, elderly, children and infants, and others. This study is particularly interested in the private wage earners only because, in Malaysia, private employers can offer any salary as long as it is above the minimum.

Table 2 shows the sample characteristics and the percentage of the proportion. After excluding other activity statuses, the sample size in 2022 was reduced from 26,225 to 12,735; for 2019, from 24,872 to 11,698; and for 2016, from 23,536 to 11,451. On average, most households are Bumiputera, which is 64.72% of the total sample. With more than 70% of these households residing in urban areas and Peninsular Malaysia, geographically and demographically, they are concentrated in certain regions. Over 84% of the HOHs are male; per the Department of Statistics Malaysia (DOSM) 2022 report, the national male labour participation rate was 80.9%. The proportion of HOH working as a professional increased from 10.44% (2016) to 11.38% (2019) and 15.26% (2022). HOHs were also getting higher qualifications, degrees and above. Diploma and SPM showed an

increasing trend, while STPM, PMR and no certification showed a declining trend across the three years.

TABLE 2
Sample Characteristics

	2022		2019		2016	
	Sample size	%	Sample size	%	Sample Size	%
Total	12,735		11,698		11,451	
Bumiputera	8,319	65.32	7,698	65.81	7,220	63.05
Non-Bumiputera	4,416	34.68	4,000	34.19	4,231	36.95
Urban	10,021	78.69	8,523	72.86	8,705	76.02
Rural	2,714	21.31	3,175	27.14	2,746	23.98
Peninsular	9,534	74.86	8,608	73.59	8,372	73.11
East Malaysia	3,201	25.14	3,090	26.41	3,079	26.89
Male	10,802	84.82	9,979	85.31	9,837	85.91
Female	1,933	15.18	1,719	14.69	1,614	14.09
Professional	1,943	15.26	1,331	11.38	1,195	10.44
Non-professional	10,792	84.74	10,367	88.62	10,256	89.56
Degrees and above	2,269	17.82	1,532	13.10	1,280	11.18
Diploma	2,090	16.41	1,776	15.18	1,655	14.45
STPM	269	2.11	287	2.45	320	2.80
SPM	5,509	43.26	5,027	42.97	4,739	41.39
PMR	1,250	9.82	1,407	12.03	1,607	14.03
No certification	1,348	10.59	1,669	14.27	1,850	16.16

Table 3 shows the data descriptive of continuous variables. The HIS data shows the average log employment income *lnINCS01_hh* increased every three years: 10.71 (2016), 10.84 (2019), and 10.96 (2022). The mean log of other sources of income, *lnINCS02_hh* declined in 2019 before it increased in 2022, 8.80 (2016), 8.65 (2019), and 9.07 (2022). This shows that more HOHs are having other sources of income that could support their leisure time or potentially lower the accepted wages. The household size, *hh_size*, has reduced from 4.26 (2016) to 4.12 (2019) to 4.01 (2022). The

average HOH age, *hoh_age*, remained around 42 for all three observation years. The working experience proxy variable, the age squared, *hoh_agesq*, has also decreased over time.

TABLE 3
Data Descriptive

	2022		2019		2016	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
lnINCS01_hh	10.96	0.77	10.84	0.77	10.71	0.80
lnINCS02_hh	9.07	1.10	8.65	1.35	8.80	1.10
hh_size	4.01	1.86	4.12	1.93	4.26	1.96
hoh_age	42.07	11.18	42.60	11.38	42.64	11.34
hoh_agesq	1,923.30	996.40	1,944.16	1,019.26	1,946.40	1,011.03

4.2 BLINDER-OAXACA TWOFOLD DECOMPOSITION

It is observed from Table 4 that the log wage for Bumiputera is less than the log wage for non-Bumiputera. This means wage differential existed between Bumiputera and non-Bumiputera, evidently shown by the wage gap -0.41 (2016), -0.37 (2019), and -0.45 (2022). Note that the negative sign indicates that Bumiputera was earning less than non-Bumiputera; 2022 is the only year when predictors could explain more of the wage differential, at 52.17%, but the coefficient is the highest in 2022, at -0.45. Meanwhile, 2019 is the year with the lowest wage gap coefficient, at -0.37, but it has the highest percentage of unexplained portion, 58.33%.

TABLE 4
Twofold Decomposition Result

	2022		2019		2016	
	Coeff.	%	Coeff.	%	Coeff.	%
Bumiputera Wage	10.77***		10.71***		10.54***	
Non-Bumiputera Wage	11.23***		11.07***		10.96***	
Wage gap	-0.45***	100	-0.37***	100	-0.41***	100
Explained	-0.22***	52.2	-0.15***	41.7	-0.19***	46.3
Unexplained	-0.22***	47.8	-0.21***	58.3	-0.22***	53.7

Note: Coefficient (Coeff), *** significant at 1%.

4.3 BLINDER-OAXACA THREEFOLD DECOMPOSITION

Endowment showed the uneven distribution of the predictors between the two groups, which means, in this case, the non-Bumiputera group tends to have more preferable characteristics than the Bumiputera group. The coefficient component showed the wage disparity from not having the predictor or from variables omitted in this study.

As per Table 5, in 2016 and 2019, the coefficient and interaction were more than the endowment components by the difference of 29.27% and 32.43%. For 2022, the reversal happened; the endowment is larger than the coefficient and interaction but only by a slight percentage difference of 2.22%. The interaction part showed how the other two components interact with each other. Even though 2022 has the biggest coefficient of the wage differential, it also has the most explained and endowment portion compared to the other two observation years. On the other hand, 2019 recorded the lowest coefficient of the wage gap. However, most cannot be attributable to the endowment since 67.57% went to coefficient and interaction components. Therefore, looking at the wage gap performance alone might be misleading if we do not conduct the threefold decomposition. Decreasing the wage gap does not necessarily mean these workers are compensated fairly. Three components will be broken down to each variable used in this study to understand which predictors contribute to the wage gap.

TABLE 5
Threefold Decomposition Result

	2022		2019		2016	
	Coeff.	%	Coeff.	%	Coeff.	%
Wage gap	-0.45***	100	-0.37***	100	-0.41***	100
Endowment	-0.22***	48.89	-0.13***	35.14	-0.15***	36.59
Coefficients	-0.22***	48.89	-0.22***	59.46	-0.22***	53.66
Interaction	-0.01	2.22	-0.03**	8.11	-0.05***	12.20

Note: Coefficient (Coeff), *** significant at 1%, ** significant at 5%

Table 6 and Appendix 1 show the breakdown of the three components of each predictor for all three years. Starting with the endowment component, among all predictors, other annual household income is one of the top three predictors contributing the biggest percentage, 40.02% (2022), 30.12% (2019), and 31.65% (2016). In

other words, reducing the other source of income disparity between Bumiputera and non-Bumiputera will lead to a wage gap reduction of approximately 40% in 2022. Among all levels of qualification used for this study, having a bachelor's degree would help Bumiputera the most to narrow down the wage differential, 37.04% (2022), 39.65% (2019), and 23.82% (2016). Next, it shows that more Bumiputera resided in rural areas compared to the non-Bumiputera who stayed in urban areas, causing Bumiputera to receive lower employment income. The percentage of contribution that the disparity in urban residents' income, *strata* caused to the endowment component is 33.58% (2022), 47.48% (2019), and 20.31% (2016). Not all predictors in endowment would widen the wage gap; a positive coefficient in the endowment signifies that the respective predictors would reduce the differential.

The top three predictors that showed the largest reduction are household size, gender of HOH, and marital status. The larger the household size, the more employment income contributed, meaning that Bumiputera households with more members have a higher paid employment income. The percentage for three years is 32.66% (2022), 45.52 (2019), 24.36 (2016). However, the log of annual employment income is a proxy to the HOH salary, other working family members and adding up to paid employment income may have amplified the coefficient. Nevertheless, having more working members would help narrow the wage gap by a significant percentage for Bumiputera households. Next, there are more male HOH for Bumiputera than non-Bumiputera, and they are married compared to the counterpart group. HOH being male and married would help reduce the wage gap by 9.6% (2022), 18.20% (2019), and 9.18% (2016). All these variables, however, are personal characteristics of HOH and do not reflect the outcomes of productivity traits. Other significant predictors with disparity and caused widening of the wage gap in all three years are: professional occupations, age squared, no certificate, SPM qualified, and Peninsular Malaysia residents' income. Even though they are not the top three predictors that cause the wage gap, improving the educational level to produce more Bumiputera professionals would reduce the wage gap.

TABLE 6
Endowment, Coefficient and Interaction Components' Coefficients

	Endowment			Coefficient			Interaction		
	2022	2019	2016	2022	2019	2016	2022	2019	2016
dstrata	-0.07***	-0.06***	-0.04***		0.08***	0.18***		-0.02***	-0.06***
dregion	-0.02***	-0.02***	-0.01***		-0.07***	-0.08***		0.01***	0.01***
hh_size	0.07***	0.06***	0.05***	-0.08***	-0.08***		-0.02***	-0.01**	
dhoh_gen	0.01***	0.01***	0.01***						
hoh_agesq	-0.02***	-0.01***	-0.01***	0.08***	0.10***	0.08***	-0.01***	-0.01***	
lnINCS02_hh	-0.09***	-0.04***	-0.07***	-1.22***	-0.73***	-0.96***	0.06***	0.04***	0.05***
dmarital	0.02***	0.01***	0.01***	0.03***			-0.01***		
dcert_degree	-0.08***	-0.05***	-0.05***						
dcert_dip									
dcert_spm		-0.02***							
dcert_pmr				-0.02**					
dcert_nil	-0.02***		-0.01***						
docc	-0.02***	-0.01***	-0.01***	-0.11***	0.02***		-0.02***	-0.01***	

Note: *** significant at 1%, ** significant at 5%, insignificant coefficients are removed for visibility and simplicity

Next, we examine the predictors for coefficient and interaction components. Predictor *lnINCS02_hh* has the highest coefficient and percentage under the coefficient. Taking away the disparity in having other sources of income, the wage gap would widen by 562.22% (2022), 339.69% (2019), and 432.62% (2016). In other words, even if two HOHs from different groups of ethnicities are identical in that both have or do not have other sources of income, the Bumiputera HOH would still be earning less than the non-Bumiputera counterpart. Recall that the exact predictor also occurred under the endowment effect as the top contributor. Still, the magnitude of the coefficient component effect for this predictor is far larger than for the endowment part. Other significant predictors under the coefficient include professional occupations, squared of age, lower secondary school certification (PMR), Peninsular Malaysia, urban and rural disparity, and marital status. Since the interaction portion is how the other two components interfere with one another, all predictors that are significant under interaction are the same as under the coefficient part.

5. CONCLUSION

5.1 POLICY RECOMMENDATION

In the awakening of discrimination toward marginal groups, developed countries have implemented labor economic policies to tackle issues regarding labor market discrimination. For example, employers in developed countries such as the United States, European Union country members, and the United Kingdom advertise their vacancies with the premise that they are practising inclusive recruitment to protect individuals who are discriminated against based on characteristics unrelated to their skills or productivity such as race and ability status. These corrective measures have finally taken place thanks to the extensive studies of wage differential analysis. For example, in 1995, a survey of the black-white wage ratio showed that whites earned 21% more than blacks significantly (Borjas, 2016). The relative economic status of blacks has improved ever since, and the wage ratio has improved from 0.40 in 1940 to 0.76 in 2012 for black males and 0.75 in 1967 to 0.87 in 2012 for black females (Borjas, 2016). The Equal Employment Opportunity Commission (EEOC) was established by the enactment of the 1964 Civil Rights Act; affirmative action by the government resulted in the bettering economic status of the black race, judged by the improved disparity of school quality,

higher return-to-school rate, and increased black human capital (Borjas, 2016). Apart from combating discrimination due to skin color, the United States Congress showed its commitment to reducing gender wage inequality in the workplace when they passed the Equal Pay Act and the Civil Rights Act in the 1960s, which demands equal wages for employees regardless of their gender as long as they do similar work (Calcagno and Montgomery, 2020). This act was imposed on private firms, however, and left out female public sector employees because the Republican members received a more significant gender wage gap compared to Democrats or Independents (Calcagno and Montgomery, 2020).

From these examples of race and the gender wage gap, we learned that even though awareness concerning the wage gap is spread through both academia and industries, the statistical persistence continued to exist to date, and the work is still ongoing for governments, researchers, and employees to push through an equal pay to protect the discriminated groups. The push for equal pay is based on principles of fairness, social justice, and economic efficiency. Wage disparities limit the marginalized group's economic mobility and their overall well-being. In Malaysia, the Shared Prosperity Vision 2030 and Madani framework emphasize inclusive and sustainable growth, focusing social equity and equitable opportunities. This calls for policies that address wage gaps and fair compensation based on labor productivity traits. By the time this study was conducted, no similar policy existed in Malaysia. The government may publish a blueprint to guide employers on how to price labor based on their productivity traits.

5.2 MAJOR FINDINGS AND FUTURE RESEARCH

The wage gap decreased in 2019 but increased again in 2022. However, in 2022, explained and endowments parts are higher than unexplained and coefficient portions. Even though 2019 recorded the lowest coefficient of the wage gap, the unexplained and coefficient portions are the highest. Hence, across the years 2022, 2019, and 2016, the predictors could capture and explain more of the wage differential. The productivity-related predictor that is the most significant and has the highest magnitudes on the endowment part of wage differential is a bachelor degree; for personal characteristics, it is professional occupations, and for household characteristics are log of other household annual income, Peninsular Malaysia and household size. As for coefficient and interaction portions, the most important predictors

are the same as endowment effects, with additions of age squared, lower secondary certificate (PMR), and marital status.

Bumiputera group has a less educated workforce and fewer professional workers, indicating that this group is lagging in human capital investment. Relying solely on employment income to invest in human capital, however, would be hard because they are compensated less than the non-Bumiputera group. Hence, government intervention, such as education and training subsidies, would reduce costs and narrow the productivity disparity. Despite the government's continuous effort to improve the Bumiputera group's livelihood, the wage gap is still persistent and prevalent. Hence, legislative fair employment measures should be considered. A recommended future research is to investigate the combined effect of gender and racial discrimination towards the wage gap in Malaysia.

ACKNOWLEDGEMENT

This research was funded by the Department of Business Administration, International Islamic University Malaysia (DeBA23-028-0034). The data were supplied by the Department of Statistics Malaysia (DOSM). The authors would like to thank both departments for their assistance.

REFERENCES

- Abdullah, B., I. Theodossiou, and A. Zangelidis. "Native-immigrant Wage Differentials in Malaysia." *Journal of Population and Social Studies* 28, no. 3 (2020): 232 - 49.
- Arshad, M.N.M., and Z.A. Malik. "Quality of Human Capital and Labor Productivity: A Case of Malaysia." *International Journal of Economics, Management and Accounting* 23, no. 1 (2015): 37-55.
- Borjas, G.J. Labor Market Discrimination. In G.J. Borjas, *Labor Economics* (362-411). New York: McGraw-Hill Education, 2016.
- Cahuc, P., S. Carcillo, and A. Zylberberg. *Labor Economics, Second Edition*. London, England: The MIT Press, 2014.
- Calcagno, P.T., and M.M. Montgomery. "The Gender Wage Gap: An Analysis of US Congressional Staff Members." *Public Choice* 188 (2020): 183-201.
- Department of Statistics Malaysia. Labour Force Survey Report Malaysia Third Quarter 2023.

- Department of Statistics Malaysia. (6 December, 2022). *Bumiputera Statistics, 2022*. Department of Statistics Malaysia Official Portal: <https://tinyurl.com/DeptStatMsia>
- Economic Planning Unit, Prime Minister's Department. *The Malaysian Economy in Figures 2022*. Prime Minister's Department, 2022.
- Faustino, I., K. Maia, M.R. Gomes, P. Mourao, and E. Araujo. "Decomposing Wage Differences in Brazilian Regions: A Revised Insight about Traditional Discrimination." *International Journal of Social Economics* 50, no. 1 (2023): 1-19.
- Gramozi, A., P. Theodore, and Z. Marios. "Measuring the Welfare Cost of Racial Discrimination in the Labor Market." *Economic Inquiry* 61, no. 2 (2023): 232-52.
- Hirschman, C. "Labor Markets and Ethnic Inequality in Peninsular Malaysia." *The Journal of Developing Areas*, 1970, 18, no. 1 (1983): 1-20.
- Hussain, H. (97, 2020). *Kadar Kemiskinan Bumiputera Lebih Tinggi*. Sinar Harian: <https://www.sinarharian.com.my/article/91331/berita/nasional/kadar-kemiskinan-bumiputera-lebih-tinggi>
- Ismail, R., and Z. Mohd Noor. "Gender Wage Differentials in the Malaysian Manufacturing Sector." *International Journal of Economics, Management and Accounting* 13, no. 2 (2013): 119-37.
- Jann, B. "A Stata Implementation of the Blinder-Oaxaca Decomposition." *The Stata Journal* 8, no. 4 (2008): 453-79.
- Li, M., C. Tu, and F. Zhang. "Wage Gaps in Energy Industry: The Role of Sector." *Front. Energy Res.* 10 (2022): 940637.
- Mincer, J.A. *School, Experience, and Earnings*. National Bureau of Economic Research, 1974. <https://www.nber.org/books-and-chapters/schooling-experience-and-earnings>
- Mohd Nor, L. "An Overview of Gender Earnings Differentials in Peninsular Malaysia." *International Journal of Economics, Management and Accounting* 6, no. 1 (2013): 23-49.
- O'Donnell, O., E.v. Doorslaer, A. Wagstaff, and M. Lindelow. *Analyzing Health Equity Using Household Survey Data*. Washington, D.C.: International Bank for Reconstruction and Development / The World Bank, 2008.
- Santoso, R., G.A. Sahadewo, C. Sugiyanto, and S.U.Setiastuti. "Informal and Formal Wage Differences Based on Cohorts." *Economies* 10, no. 12 (2022): 317.

- Schultz, T.W. "Investment in Human Capital." *The American Economic Review* 51, no. 1 (1961): 1-17.
- Shahiri, H., Z. Cheng, and A. Al-Hadi. "Why Do Low-Skilled Foreign Workers Have a Wage Advantage? Evidence From the Palm Oil Plantation Sector in Malaysia." *Population, Space and Place* 27, no. 3 (2021a): 1-20.
- _____. "An Analysis of the Reduction of the Ethnic Economic Gap in Malaysia Under the New Economic Policy: Evidence from Ethnic Occupation Segregation and Wage Differential." *Jurnal Ekonomi Malaysia* 46, no. 2 (2012b): 127-39.
- Yaakub, N., T. Masron, A. Marzuki, and R. Soda. "GIS-Based Spatial Correlation Analysis Sustainable Development and Two Generations of Demographic Change." *Sustainability* 14 (2022): 1-19.
- Yusuf, S.A., and Z.A. Zainuddin. "Trends on Employment and Productivity of OIC Member Countries: An Analysis." *International Journal of Economics, Management and Accounting* 19, no. 3 (2011): 1-32.

APPENDIX 1**The Ranking of Significant Predictors in Endowment, Coefficient, and Interaction Component****TABLE 7**
Endowment Component Variable Ranking Year 2022

Rank	Predictor	Coefficient	%	P>z
1	lnINCS02_hh	-0.09	40.02	0.00
2	dcert_degree	-0.08	37.04	0.00
3	dstrata	-0.07	33.58	0.00
4	hoh_agesq	-0.02	9.03	0.00
5	docc	-0.02	7.33	0.00
6	dcert_nil	-0.02	6.83	0.00
7	dregion	-0.02	6.80	0.00
8	dhoh_gen	0.01	-2.44	0.00
9	dmarital	0.02	-7.16	0.00
10	hh_size	0.07	-32.66	0.00

TABLE 8
Coefficient Component Variable Ranking Year 2022

Rank	Predictor	Coefficient	%	P>z
1	lnINCS02_hh	-1.22	562.92	0.00
2	hh_size	-0.08	36.16	0.00
3	dcert_pmr	-0.02	8.84	0.04
4	dmarital	0.03	-13.13	0.01
5	docc	-0.11	-14.17	0.00
6	hoh_agesq	0.08	-38.95	0.00

TABLE 9
Interaction Component Variable Ranking Year 2022

Rank	Predictor	Coefficient	%	P>z
1	hh_size	-0.02	115.67	0.00
2	docc	-0.02	105.29	0.00
3	hoh_agesq	-0.01	74.27	0.00
4	dmarital	-0.01	38.42	0.01

TABLE 10
Endowment Component Variable Ranking Year 2019

Rank	Predictor	Coefficient	%	P>z
1	dstrata	-0.06	47.48	0.00
2	dcert_degree	-0.05	39.65	0.00
3	lnINCS02_hh	-0.04	30.12	0.00
4	dregion	-0.02	16.02	0.00
5	dcert_spm	-0.02	12.01	0.01
6	hoh_agesq	-0.01	11.66	0.00
7	docc	-0.01	6.56	0.00
8	dhoh_gen	0.01	-8.59	0.00
9	dmarital	0.01	-9.61	0.00
10	hh_size	0.06	-45.52	0.00

TABLE 11
Coefficient Component Variable Ranking Year 2019

Rank	Predictor	Coefficient	%	P>z
1	lnINCS02_hh	-0.73	339.69	0.00
2	hh_size	-0.08	34.76	0.00
3	dregion	-0.07	31.96	0.00
4	hoh_agesq	0.10	-46.08	0.00
5	dstrata	0.08	-36.47	0.01
6	docc	0.02	-8.23	0.01

TABLE 12
Interaction Component Variable Ranking Year 2019

Rank	Predictor	Coefficient	%	P>z
1	dstrata	-0.02	88.00	0.01
2	hh_size	-0.01	58.26	0.00
3	hoh_agesq	-0.01	54.33	0.00
4	docc	-0.01	30.41	0.01
5	dregion	0.01	-34.86	0.00
6	lnINCS02_hh	0.04	-139.27	0.00

TABLE 13
Endowment Component Variable Ranking Year 2016

Rank	Predictor	Coefficient	%	P>z
1	lnINCS02_hh	-0.07	31.65	0.00
2	dcert_degree	-0.05	23.82	0.00
3	dstrata	-0.04	20.31	0.00
4	hoh_agesq	-0.01	6.12	0.00
5	dregion	-0.01	5.35	0.00
6	dcert_nil	-0.01	5.05	0.01
7	docc	-0.01	4.37	0.00
8	dhoh_gen	0.01	-3.68	0.00
9	dmarital	0.01	-5.50	0.00
10	hh_size	0.05	-24.36	0.00

TABLE 14
Coefficient Component Variable Ranking Year 2016

Rank	Predictor	Coefficient	%	P>z
1	lnINCS02_hh	-0.96	432.62	0.00
2	dregion	-0.08	34.32	0.00
3	hoh_agesq	0.08	-37.94	0.01
4	dstrata	0.18	-83.61	0.00
5	lnINCS02_hh	-0.96	432.62	0.00

TABLE 15
Interaction Component Variable Ranking Year 2016

Rank	Predictor	Coefficient	%	P>z
1	dstrata	-0.06	127.81	0.00
2	hoh_agesq	-0.01	17.39	0.01
3	dregion	0.01	-18.37	0.00
4	lnINCS02_hh	0.05	-100.24	0.00