THE JOURNAL OF INDONESIA SUSTAINABLE DEVELOPMENT PLANNING

VOL. 3 NO. 2 - AUGUST 2022

E-ISSN: 2722-0842 | P-ISSN: 2721-8309

Available online at
journal.pusbindiklatren.bappenas.go.id

Research Paper

Gender Wage Gap: Evidence from Employment in Informal Sector

Fakhriza Akbar

Statistics of Indonesia, Jakarta, Indonesia

fakhriza@bps.go.id

ABSTRACT

The gender wage gap is still a common phenomenon in many developing countries, especially in the informal sector. As opposed to the formal sector, the gender wage gap seems more adverse in the informal sector, where women are often in unfavourable situations to lessen the substantial wage gap between them and men. This study examined the gender earnings gap from the lower level to the upper level of the wage distribution in informal sector employment using the Indonesian National Labor Survey in 2019. While the Oaxaca-Blinder method only looked at the wage gap from the differences in mean values, this research used the Recentered Influence Function (RIF) to reveal the gaps in the wage distribution. The research found the presence of a weak sticky floor effect across the wage distribution. The gender earnings gap decreased as we moved from the lower wage distribution to the upper wage distribution. Furthermore, the structure effect or unexplained factors contributed to the most prominent share of the gap that forms the wage difference for the entirety of the wage distribution, ranging from 70 per cent. Having examined the individual characteristics, education was found to be the most prominent factor that can help narrow the gap.

Keywords: Gender; Wage Gap; Informal; Labour

ARTICLE INFO

Received: June 8, 2022
Received in revised form: August 8, 2022
Accepted: December 30, 2022
doi: 10.46456/jisdep.v3i2.301

THE JOURNAL OF INDONESIA SUSTAINABLE DEVELOPMENT PLANNING
Published by Centre for Planners' Development, Education, and Training (Pusbindiklatren),
Ministry of National Development Planning/ National Development Planning Agency (Bappenas), Republic of Indonesia

Address: Jalan Proklamasi 70,
Central Jakarta, Indonesia 10320
Phone: +62 21 31928280/3192828285
Fax: +62 21 31928281
E-mail:
journal.pusbindiklatren@bappenas.go.id

Supported by Indonesian Development Planners Association (PPPI)

1. Introduction

One of the most prominent issues in the labour market is the gender wage gap, which refers to the difference between women's wages and men's wages at an equal level of productivity (Blau and Khan, 2000). The fact that women and men are paid unequally has become a global phenomenon. Each country may have different gender earnings gaps depending on the levels of income. Among the high-income countries, the Netherlands has the largest gender wage difference, with women earning around 40 per cent lower than men, followed by the Republic of Korea at about 37 per cent wage gap. The average gender wage gap is below 20 per cent worldwide for upper-middle-income and lower-middle-income groups. Meanwhile, the group of lower-income countries has the highest average gap compared to the other income groups, with about 28 per cent of women (International Labour Organization, 2018).

In Indonesia, the gender pay gap still exists where women generally earn lower salaries than men, conditional on socio-economic characteristics. Pirmana (2006) discovered that women make 23 per cent less than men, in which 42 per cent of the difference resulted from the differences in individual characteristics such as education and experience, while 58 per cent was due to discrimination. Taniguchi and Tuwo (2014) claimed that a significant gender wage gap might be caused by several factors, such as types of occupation, industry categories, work hours, age, and educational levels. Thus, female workers' wages are constantly and extensively inferior to those of male workers because of non-market factors.

Studies focusing on this issue within the Indonesian context are still limited due to the sole focus on the wage gap in general (Hennigusnia, 2014; Mardiana, 2015; Pirmana, 2006). However, none of the studies explored more specific sectors, such as the informal sector. It is important to portray the wage gap in the informal sector as workers often experience unfavourable situations compared to those in the formal sector (Pooittiwong, 2017). This situation is a result of informal labour market characteristics such as lack of social protection, work hours, regulations, and minimum wage policy. Consequently, the wage gap in the informal sector becomes increasingly wide. In Indonesia, women who work in the informal sector accounted for 61,37 per cent in 2017 compared to men at 54,34 per cent (Badan Pusat Statistik Indonesia [BPS], 2018). Women in informal employment mostly have two-fold negative consequences: first, informal employees earn less than formal employees, and women are paid less than men. Women are over-represented in the lower part of the informal work-related segment. Thus, this fact proves that the gender wage gap may also be greater in the informal sector than in the formal sector (Organization for Economic Cooperation and Development [OECD], 2020).

There are two types of trends in the gender wage gap, which are called the glass ceiling effect and the sticky floor effect. The glass ceiling effect, which portrays a larger gap in the upper wage distribution, commonly occurs in many advanced countries (Albrecht et al., 2003; Arulampalam et al., 2007; De la Rica et al., 2005). Meanwhile, a larger wage gap in lower income distribution referred to as the sticky floor effect, is generally found in some developing countries. In China, the wage structure effect is the prominent reason behind the increase in the gap in total gender incomes rather than the differences in gender characteristics (Wei and Li, 2007). Similarly, Fang and Sekellariou (2011) also stated the presence of a robust sticky floor effect in the Thailand labour market depicted women's difficulty in maintaining similar wages to men at the lower distribution. The unexplained factors still become the reasons behind the gender wage gap, and the differences in characteristics can elucidate only a small part of the gender wage gap. This situation implies that women tend to occupy less favourable positions at a lower wage distribution than men. The wage distribution can portray the labour market segmentation, in which informal employment mostly dominates the bottom-end distribution. This situation leads to the sticky floor effect (Tannuri-pianto & Pianto, 2004; Ruzik & Rokicka, 2012).

Among individual endowments, human capital in education plays a major role in reducing the gender wage gap. Kassenboehmer and Sinning (2014) found that women with higher educational levels may have a better chance of narrowing the bottom wage distribution gap. Similarly, Blau and Kahn (2007) stated that human capital, such as educational attainment, can help women reduce the wage differences at the bottom and middle-wage distribution. Education also plays a role in the Korean labour market; Sun and Kim (2017) revealed that women's return to education is higher at the upper wage distribution than at the lower wage distribution.

This study attempted to fill this gap in the existing body of research and analysed the determining factors behind the gender wage gap in the informal sector in Indonesia. This research had policy implications for gender inequality in the Indonesian labour market, especially in the informal sector.

2. Methodology

Most research related to the gender wage gap focused on the mean differences generated through the Oaxaca-Blinder Decomposition method, proposed by Oaxaca (1973) and Blinder (1973). However, Firpo et al. (2018) extended the Oaxaca-Blinder wage decomposition with an additional method called Recentered Influence Functions (RIF). The method comprises two stages; Firstly, the wage distribution is separated into two factors called the composition effect and structure effect with the counterfactual distribution for the two-fold decomposition. Second, the structure and composition effects are applied to each variable, basically similar to the method of Oaxaca-Blinder. The critical difference between the current study and the study of Oaxaca-blinder is the use of the method developed by Firpo et al. (2009) and Fortin et al. (2011) in the current study, in which the dependent variable of the regression is substituted by a suitable RIF. This method allows us to decompose the wage differential at any percentiles by using the standard Blinder-Oaxaca decomposition.

The RIF unconditional percentiles regressions apply estimation for men, women, and counterfactual earnings distributions:

$$\widehat{RIF}(Y_k; \hat{q}_\tau) = X_k \hat{\beta}_k, \qquad \text{k=m,f,c} \qquad (1)$$

Where $\widehat{RIF}(Y_k; \hat{q}_\tau)$ represents RIF estimate for the τ th percentiles and $\hat{\beta}$ represents the estimate of unconditional percentiles partial effect. Meanwhile, the subscripts *m, f, and c represent men, women, and counterfactuals*. Thus, decomposition can be derived as follows:

$$\hat{q}_\tau(Y_m) - \hat{q}_\tau(Y_f) = \{\underline{X}_f(\hat{\beta}_c - \hat{\beta}_f) + \hat{R}_\tau^s\} + \{(\underline{X}_m\hat{\beta}_m - \underline{X}_f\hat{\beta}_c) + \hat{R}_\tau^c\} \qquad (2)$$

Where $\hat{q}_\tau(Y_m) - \hat{q}_\tau(Y_f)$ denotes the raw gender wage gap at the τ th percentiles and $\underline{X}$ detonates the vector of covariates averages. Since $\hat{\beta}_c$ is from the counterfactual distribution, which assumes men return to labour characteristics for women, $(\hat{\beta}_c - \hat{\beta}_f)$ measures the men-women differences in return to labour market characteristics. Thus, $\underline{X}_f(\hat{\beta}_c - \hat{\beta}_f)$ represents the structure effect, i.e., the gender wage gap at the τ th percentiles due to different returns. Meanwhile, $(\underline{X}_m\hat{\beta}_m - \underline{X}_f\hat{\beta}_c)$ represents the composition effect, i.e., the gender wage gap at the τ th percentiles due to the endowment differentials. $\hat{R}_\tau^s$ and $\hat{R}_\tau^c$ are the estimate of the approximation error corresponding to the structure effect and composition effect.

This study applied cross-section data from the National Labor Force Survey (Sakernas) in 2019. The survey is conducted twice a year, in February and in August. The two surveys are different in terms of estimation levels in which the February Sakernas gas a province-level analysis (50.000 households) while the August Sakernas has regency-level estimation (200.000 households). This research applied a sample from August Sakernas because it had a higher level of analysis. The household survey contains detailed information related to labour, such as wage, education, type of occupation in the household, age of workers, monthly income, and other variables. This study only focused on employees and casual workers (consisting of 114,021 individuals) aged 15—65 years in the informal sector. For variables, the wage is defined as money and goods earned by the workers in the previous month.

As this paper focused on the informal sector, we derived the concept of informality from the International Conference of Labor Statisticians (ICLS). BPS recently adopted the latest ICLS-17 concept related to informality by incorporating more informality-targeted questions in labour survey questionnaires. In this study, we chose specific questions related to access to social security and job contract to determine employment in the informal sector:

1. Does the company/business/workplace provide health insurance/ work injury insurance/ protection from work-related death?
2. Does the company/business/workplace provide annual leave/sickness/maternity without cutting wage/salary?
3. Do you have an agreement/employment contract/decision letter?

Table 1: List of Variables

Variable	Type	Notation	Note
Natural Log of Wage	Dependent Variable	Lnwage	Wage per hours
Experience	Independent Variable	exper	Experience from the primary job (negative values set to zero)
Training	Independent Variable	train	Dummy var: 0: no training experience (reference) 1: have training experience
Area of living	Independent Variable	area	Dummy var: 0: rural (reference) 1: urban
Marital Status	Independent Variable	marital	Dummy var: 0: not married (reference) 1: married
Head of Household	Independent Variable	headhh	Dummy var: 0: not head of household (reference) 1: head of household
Education	Independent Variable	Primeduc, highsch, college	Dummy var: primeeduc&below (references) 1: highsch 1: college
Type of sectors	Independent Variable	Agriculture manufacture mining trade transport business services other services	Dummy var: agriculture (references) 1: manufacture 1: mining, energy, and construction 1: trade 1: transport, storage, and communication 1: business services 1: other services

3. Results and Discussions

The finding showed some differences in the mean values of the independent variable. For income, male workers have 70 % higher income than women in the informal sector. In terms of age, the ages of men and women are not significantly different, with men being 37 years old on average and women being 38 years old in general. In regards to work hours, males work longer (184 work hours per month) than women (163 hours per month). Table 2 shows that men had more experience in informal sector employment (7.2 years of experience) compared to women (5.9 years of experience).

Table 2: Summary Statistics

Variables	Men		Women	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
Income (Rp per month)	1,895,681	1,185,766	1,113,032	901,145
Workhour (per month)	184.6	57.1	163.4	68.9
Lnwage	9.1	0.6	8.7	0.7
Education (in years)	7.6	4.1	7.6	4.6
Variable	**Men**		**Women**	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
Age	37.8	12.3	38.5	12.7
Experience	7.2	8.5	5.9	7.9

Source: Author's calculation

Table 3 shows the average wage per hour for both genders, where men's hourly wage is higher than women's hourly wage at all group levels. Viewed from the educational attainment variable, overall, men earned higher per hour compared to their female worker counterparts. Women with a higher education level have more advantages than women at the primary or college level. Women's average wage over men is 67 per cent to 70 per cent. Concerning the area of living, women who reside in urban areas have higher wages than women in rural areas, which is 71 per cent of the men's total earnings in urban areas. Meanwhile, the differences in the average hourly wage for men in rural and urban areas appear insignificant compared to the average hourly wage for women.

In the sector of segregation, men have a higher average hourly pay in almost all sectors than women except in real estate and government administration. Women may have more opportunities to obtain higher earnings if they work in the following sectors such as mining, transportation, business services (financial & insurance, real estate, and firm assistance), and government. The highest average hourly pay for women is in the real estate sector and finance & insurance for men.

Table 3: Mean Wage per Hour for Men and Women

Mean Wage per Hour	Men	Women	Ratio W/M
Education			
Primary	10,769.6	7,164.4	67 %
High School	11,656.1	8,154.7	70 %
College	17,283.2	11,533.7	67 %
Area			
Rural	10,639.1	6,937.4	65 %
Urban	11,459.0	8,189.1	71 %
Sectors			
Agriculture	9,980.1	6,890.8	69 %
Mining	12,300.7	10,249.7	83 %
Manufacture	10,459.9	6,559.2	63 %
Electricity and Gas	13,846.9	7,975.2	58 %
Water, Waste and Recycle	10,313.9	5,666.2	55 %
Construction	11,360.6	9,782.7	86 %
Wholesale	10,550.5	7,778.6	74 %
Transportation	13,084.0	12,137.4	93 %
Accommodation & Food	9,516.1	7,538.5	79 %
Information & Communication	11,847.5	7,682.2	65 %

Mean Wage per Hour	Men	Women	Ratio W/M
Finance & Insurance	15,801.0	13,624.3	86 %
Real Estate	15,064.8	31,476.6	209 %
Firm Service	13,381.7	11,228.5	84 %
Government Administration	10,694.6	11,334.0	106 %
Education	10,341.5	8,476.0	82 %
Health & Social Services	11,241.3	8,944.4	80 %
Other Services	12,141.2	7,916.5	65 %

Source: Author's calculation

In terms of education, male workers have a higher proportion of wage at all level of education, except at a higher education level. More than 70 per cent of men have primary education and secondary education levels. In contrast, only around 25% women, have both education levels. However, the proportion of female workers with tertiary educational background, reached more than 50%, whereas men only have around 47,6 per cent share at this level of education.

Table 4: Gender and Education Level

Type of Gender	Education Level (%)			
	No Education	Primary Education	Secondary Education	Tertiary Education
Men	66.1	74.2	70.4	47.6
Women	33.9	25.8	29.6	52.4
Total	100	100	100	100

Source: Author's calculation

In the sector of segregation, female workers in primary and secondary sectors seem underrepresented in informal sectors, such as agriculture, mining, construction, or transportation, compared to men workers. Meanwhile, women's contribution is more evident in some industries, such as accommodation and food, education, health, social services, and other industries. From the share of sectors, the agriculture sector is more dominant with both men and women working in it, accounting for 21.83 per cent, followed by construction at 20.81 per cent and the industry sector at 15.73 per cent.

Table 5: Gender and Type of Sectors

Type of Sectors	Per centage (%)		
	Men	Women	Share by Sector
Agriculture	71.12	28.88	21.83
Mining	95.58	4.42	1.77
Manufacture	64.86	35.14	15.73
Electricity and Gas	92.31	7.69	0.18
Water, Waste, and Recycle	78.49	21.51	0.45
Construction	98.83	1.17	20.81
Wholesale	66.80	33.20	13.56
Transportation	96.35	3.65	4.32
Accommodation & Food	43.85	56.15	4.51

Type of Sectors	Per centage (%)		
	Men	Women	Share by Sector
Information & Communication	62.60	37.40	0.46
Finance & Insurance	69.21	30.79	0.64
Real Estate	82.77	17.23	0.27
Firm Service	81.10	18.90	1.72
Government Administration	71.91	28.09	0.61
Education	30.17	69.83	1.93
Health & Social Services	31.73	68.27	0.60
Other Services	36.23	63.77	10.63

Source: Author's calculation

Tables 6 and 7 illustrate the unconditional RIF for both men and women at three percentiles: the 10^{th}, 50^{th}, and 90^{th} percentiles. The interpretation of this method is slightly similar to ordinary least squares estimation, in which the coefficient estimates of each variable refer to the marginal effects of explanatory variables. In the median percentiles, men who are the head of a family have 9 per cent higher earnings than men who are not the head of the family. Similarly, married men had 9 per cent higher wages than unmarried men. In regards to education, men who completed high school have higher earnings than men who only have a primary education background, accounting for 10 to 13 per cent in all percentiles. The return to education for college-level men rose from the lower percentiles to the upper percentiles, which is 56 per cent higher than men who completed the primary school level in the 90^{th} percentile.

Table 6: Men's Recentered Influence Function

Variables	Coef.	t stats	Coef.	t stats	Coef.	t stats
	10th		50th		90th	
exper	0.004***	6.210	0.002***	7.350	0.002***	3.770
training	-0.046*	-2.010	-0.034**	-3.000	-0.116***	-5.920
area	0.097***	9.080	0.033***	6.950	-0.002	-0.370
headhh	0.082***	5.510	0.094***	13.840	0.120***	13.020
marrital	0.153***	9.670	0.091***	13.190	0.062***	6.740
highsch	0.105***	9.090	0.101***	18.770	0.135***	16.590
college	0.151***	4.710	0.247***	16.420	0.560***	17.760
manufacture	0.220***	12.190	0.043***	5.220	-0.019	-1.820
mining	0.241***	17.300	0.224***	37.240	0.007	0.810
trade	0.164***	8.520	0.028***	3.270	-0.002	-0.210
transport	0.161***	8.110	0.115***	12.970	0.169***	12.160
business	0.143***	4.120	0.167***	10.740	0.273***	9.940
services	-0.057*	-2.200	0.024*	2.280	0.100***	6.290
_cons	7.964	285.350	8.925	692.200	9.717	455.450

Note: standard errors in parentheses* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's calculation

In terms of sectors, men working in the business or transport sector earn 10 per cent higher than men in the agriculture sector in all percentiles. The marginal effect is higher in the lower percentiles than

in the higher parts of the living areas. Men in urban areas have around 22 per cent higher earnings than men in rural areas. However, this marginal effect decreases in the higher wage percentiles, which is only about 3 per cent in the 90th percentile.

For women, in the education variable, the marginal effect of high school and college is more elevated than their male counterparts, except in the 10th percentile. In detail, women who completed high school have more than 10 per cent higher earnings in the 50th and 90th percentiles compared to women with only primary education, which are about 14 per cent and 17 per cent, respectively. Similarly, women with a college education have 24 per cent and 66 per cent higher earnings than women who only completed primary school. In terms of marital status, married women also have higher income at about 11 per cent in the median percentile. Its marginal effect rises to about 15 per cent in the higher percentiles of women who are not married. Like men, working in business services (finance, insurance, or firm service) in the informal sector contributes to a higher return in earnings than other sectors, which is about 64 per cent higher in the upper percentiles.

Meanwhile, the effect of living areas on wage changes decreased as the percentiles moved to a higher distribution. Women living in urban areas have about 21 per cent higher income than women living in rural areas in the 10th percentile, and this marginal effect declines to only 10 per cent in the 90th percentile. Experience in the informal sector does not affect the wage for women in all percentiles, but it has a negligible effect on the men's wage changes.

Table 7: Women's Recentered Influence Function

Variables	Coef.	t stats	Coef.	t stats	Coef.	t stats
	10th		50th		90th	
exper	0.003*	2.530	0.001*	2.240	0.001	1.600
training	0.030	1.040	-0.050**	-2.930	-0.154***	-4.520
area	0.205***	12.400	0.134***	14.780	0.104***	7.790
headhh	0.060**	2.660	0.089***	6.750	0.121***	5.900
marrital	0.066***	3.840	0.106***	10.490	0.153***	9.460
highsch	0.124***	7.220	0.141***	13.290	0.174***	9.900
college	-0.055	-1.710	0.235***	13.260	0.662***	16.480
manufacture	-0.155***	-5.500	-0.132***	-9.560	-0.090***	-4.820
mining	0.033	0.580	0.178***	5.990	0.228***	4.070
trade	0.154***	5.600	-0.050**	-3.220	0.012	0.510
transport	0.167***	6.090	-0.035*	-2.080	-0.009	-0.370
business	0.340***	9.500	0.235***	8.530	0.636***	9.030
services	0.078***	3.400	-0.089***	-7.020	0.019	0.980
_cons	7.572***	199.880	8.596***	392.630	9.375	231.720

Note: standard errors in parentheses* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's calculation

Prior to performing the analysis, we divided the sample into three groups: pooled (114.020 samples), employees (74.293 samples), and casual workers (39.727 samples). The analysis aimed to find the general condition of the gender gap and the characteristics of the employee and casual workers. The gender wage gap is higher at the lower bottom of the distribution in the pooled group and decreases after the 50th percentile. However, the sticky floor effect is not general because the wage gap between the 10th and 25th is lower than 2 per cent.

In the 10th percentile, the differences in characteristics can explain 30,4 per cent (0,144) of the gender wage gap compared to the structure effect, which can only describe 69,6 per cent (0,329) of the gender wage gap. However, at the upper wage distribution, the composition effect decreases significantly to only about 8,7 per cent (0,0271). The result implies that at the top wage distribution, the gap in

characteristics between gender only describes a small portion of the gender wage gap. The wage structure effect with discrimination or excluded variables becomes prominent to induce the gap. Consequently, the characteristic difference decreasing along the wage distribution suggests that women can narrow the gender wage gap by almost one-third at the bottom wage distribution if they are not subject to discrimination or other factors.

Table 8: Decomposition of Gender Wage Gap of Pooled Samples at Percentiles

	10th	**25th**	**50th**	**75th**	**90th**
Gender wage gap	0,473	0,491	0,470	0,390	0,311
Composition Effect	0,144	0,146	0,118	0,0653	0,0271
Structure Effect	0,329	0,345	0,352	0,324	0,284
Explained					
exper	0,002	0,001	0,001	0,000	0,000
training	-0,001	-0,001	-0,001	-0,001	-0,003
area	-0,010	-0,007	-0,003	-0,002	0,000
headhh	0,069	0,062	0,060	0,055	0,066
marrital	0,016	0,014	0,009	0,007	0,006
highsch	0,000	0,000	0,000	0,000	0,000
	10th	**25th**	**50th**	**75th**	**90th**
college	-0,005	-0,008	-0,009	-0,013	-0,022
manufacture	-0,010	-0,005	-0,002	0,000	0,001
mining	0,073	0,086	0,069	0,032	0,001
trade	-0,005	-0,003	-0,001	0,000	0,000
transport	-0,001	-0,003	-0,001	-0,001	-0,001
business	0,001	-0,003	0,001	0,001	0,001
services	0,015	-0,003	-0,005	-0,013	-0,022

Source: Author's calculation

Table 9 shows the Recentered Influence Function (RIF) decomposition in five percentiles: 10th, 25th, 50th, 75th, and 90th -percentiles for the employee group. The gender wage gap is higher in the lower percentiles compared to that in the upper percentiles. In the 10th percentile, the gender wage gap accounts for 45 per cent log points, which increases to 48 per cent log points in the 25th percentile. However, the gap decreases to about 29 per cent log points in the 90th percentiles at the upper percentiles. Thus, this study found no sticky floor effect in the employee category.

Table 9: Decomposition of Gender Wage Gap at Percentiles for Employees

	10th	**25th**	**50th**	**75th**	**90th**
Gender wage gap	0,446	0,477	0,484	0,394	0,290
Composition Effect	0,176	0,165	0,125	0,070	0,0261
Structure Effect	0,271	0,312	0,359	0,324	0,264
Explained					
exper	-0,001	-0,001	0,000	0,000	0,001
training	-0,002	-0,001	-0,001	-0,002	-0,004
area	-0,010	-0,006	-0,004	-0,002	-0,002
headhh	0,069	0,071	0,060	0,059	0,062
marrital	0,020	0,017	0,011	0,008	0,007
highsch	-0,002	-0,002	-0,002	-0,002	-0,002
college	-0,007	-0,012	-0,013	-0,019	-0,030
manufacture	-0,003	-0,002	0,001	0,002	0,002
mining	0,056	0,065	0,052	0,018	0,004

	10th	25th	50th	75th	90th
trade	-0,002	0,000	0,002	0,002	0,002
transport	0,000	0,000	0,000	0,000	-0,001
business	0,000	0,001	0,001	0,001	0,002
services	0,058	0,037	0,019	0,005	-0,014

Source: Author's calculation

Although the gender wage gap tends to decrease as percentiles move to the top, the composition effect seems to experience a decline. In the 10th percentiles, almost 18 per cent log points (40 per cent of the total wage gap), the gender wage gap occurs due to the gap in individual characteristics between male and female employees in the informal sector. In 50th percentiles, the covariates only describe 13 per cent log points of the gender wage gap (26 per cent). Furthermore, in the 90th percentile, only about 3 per cent log point (9 per cent) characteristics can explain the difference in wages between the two types of gender. The lower gender wage gap at the upper wage distribution indicates that women may have higher incomes without discrimination.

The structure effect still dominates the portion of the gap compared to the composition effect, ranging from 60 per cent log points to 91 per cent log points. The negative value for the composition effect means that women have more characteristics than men, while the positive value means otherwise. The segregation sector can describe the gender wage difference for employment in the informal sector. Mining, energy, and construction are other variables that contribute to men's higher wages. This sector shows a high wage ratio of men per women at 84 per cent or 23,21 per cent of all sample work in these sectors. For women, the return to education at the college level increases as the wage distribution moves to higher percentiles. It indicates that women should invest more in higher education to reduce the wage gap between them and their male counterparts. Meanwhile, marital status also significantly affects the gender wage gap. Married men tend to have a positive contribution of about 2 per cent to the gender wage gap at the lower-wage distribution.

The head of the household variable significantly extends the pay gap between men and women. Becoming the head of a household contributes to an average of 6 log points in all wage distribution because this role implies that men or women have a responsibility as a breadwinner. Furthermore, the head of a family has the power and influence on decision-making related to asset and income allocation. In Indonesian culture, men are generally the primary breadwinner while women are expected priority is to manage the household. One factor that affects the gender wage gap in Indonesia is that women may have less influence on decision-making and have fewer opportunities to invest in human capital, such as education.

Table 10: Decomposition of Gender Wage Gap at Percentiles for Casual Worker

	10th	25th	50th	75th	90th
Gender wage gap	0,533	0,556	0,503	0,424	0,341
Composition Effect	0,154	0,167	0,149	0,094	0,051
Structure Effect	0,378	0,389	0,354	0,33	0,29
Explained					
exper	0,016	0,014	0,011	0,008	0,011
training	0,000	0,000	0,000	0,000	0,000
area	0,001	0,001	0,000	0,000	0,000
headhh	0,053	0,046	0,047	0,045	0,049
marrital	0,005	0,004	0,003	0,002	0,001
highsch	0,001	0,003	0,004	0,005	0,007
college	0,000	0,000	0,000	0,000	0,000
manufacture	-0,002	-0,001	-0,001	0,001	0,001
mining	0,084	0,109	0,093	0,046	-0,007
trade	0,000	0,000	0,000	0,000	0,000
transport	0,004	0,004	0,004	0,004	0,006

	10th	25th	50th	75th	90th
business	-0,001	0,000	0,000	0,000	0,001
services	-0,006	-0,012	-0,013	-0,018	-0,018

Source: Author's calculation

In casual workers groups, the sticky floor effect is significant. Casual work negatively affects women's individual incomes compared to the potential earnings of full-time employees (Pennington, 2021). The gender wage gap in the 10th percentile is 53 per cent log points, which rises to 56 per cent log points in the 25th percentile before a decline to 50 per cent log points in the 25th percentile. This condition satisfies the sticky floor effect, referring to the wage gap between the 10th and 50th percentiles of more than 2 per cent of log points (Arulampalam et al., 2007). It suggests that women who receive lesser hourly earnings might suffer from immense discrimination without legal regulations such as minimum wage.

As opposed to full-time employment, women in casual work are generally dictated to the times and terms of work by the contract employer. As a result, women with children or other household responsibilities may find it difficult to manage their own work hours due to the potential of irregular and unpredictable work hours or schedules. In addition, the gender wage gap for casual workers in the informal sector is higher than that of full-time employees for all percentiles. The apparent difference is the significant and positive sign of experience favouring men in casual workers. It may be due to the natural characteristics of casual workers who have different experiences in different jobs. Although both dummies had a positive sign that denotes the return favour for men's wage, the magnitude is too small in the education variable.

Discussions

In terms of education, a negative sign in decomposition implies that women are more qualified than men, especially those with a tertiary education background. This study found that women can reduce the gender wage gap across wage distribution when they have high education. This result is in accordance with the study of Psacharopoulos and Patrinos (2004), in which higher education (secondary and tertiary) gives more return to women compared to men. Education for women is expected to diminish the wage gap and boost women's participation in the labour market (Chaykowski & Powell, 1999; Bobbitt-Zeher, 2007). The magnitude of college attainment also becomes more prominent as the wage moves to the upper-level distribution. Landmesser (2019) stated that higher average levels of education among women reduce income inequalities. As the gender wage gap becomes smaller in the wage distribution, individual characteristics that explain the sources of the wage gap also reduce. Education is the most effective way for women to narrow the gender pay gap.

This study found that there is a marriage premium among men who serve as the primary breadwinner for the family. This is consistent with the previous studies, which suggest that married men tend to gain an advantage in income compared to unmarried men (Korenman & Neumark, 1991; Juhn & McCue, 2017). Married men in the 10th percentile have the highest return compared to men at the upper level. The theoretical reason for the relationship between marital status and wages is that men tend to become more productive due to the process of household allocation between spouses (Becker, 1981; 1985; Korenman & Neumark, 1991). However, the magnitude of marriage premium for men tends to decrease along the wage distribution.

Meanwhile, the effect of marriage on women's wages in the informal sector along the wage distribution is well established in comparison to men's wages. While the positive effect of marital status on women results in wages premium (McConnell & Valladares-Esteban, 2021), others claimed that marital status is not related to women's wages (Bonnet et al., 2022; Hewitt et al., 2002). Women's marriage premium in the informal sector shows different trends in wage distribution compared to men's case. The return of marriage for women's wages rises from the bottom wage distribution to the upper wage distribution. Married men are in a favourable position to earn more wages than women. Married women seem to have fewer hours as they have an unbalanced division of labour within the household.

A significant number of researchers claimed that the role of occupational segregation is still dominant in creating the gender wage gap (Blau & Kahn, 2007; England et al., 2000). The occupational segregation in this study also contributed to the gender wage gap. Men are obviously dominant in all sectors except in real estate and government administration. Furthermore, some studies showed various mixed results when calculating the relationship between occupational segregation and the gender wage

gap. While Polachek (1987) argued that occupational segregation only contributes a minor role in explaining the gender wage gap, Hegewisch and Hartmann (2014) claimed that occupational segregation should prioritise narrowing the gender wage gap.

Our findings show that the unobserved variables, such as discrimination, are a prominent cause of the gender wage gap along the wage distribution. The presence of discrimination has to be carefully explained as we need to consider unexplained factors, such as social norms or cultural factors, that may affect the gap. The unsolved factors were difficult to explain comprehensively in this study as relevant data were unavailable. From this point, the estimated size of 'discrimination' can consequently be used on the weight of any omitted exogenous variables and other unobserved variables that may influence wages.

Conclusions

This paper investigated the phenomenon of the gender wage gap in the informal sector throughout the wage distribution in Indonesia using the Indonesian National Labour Force Surveys (SAKERNAS) data during 2019. Recentered Influence Function (RIF) regression and decomposition were applied for two separate categories of occupation: full-time employees and casual workers.

Women earn lower wages than men, and the sticky floor effect on employment in the informal sector is weak. While the gender wage gap among employees is higher in the median wage distribution, the sticky floor effect only appears in the casual worker category. However, each quantile's wage structure effect is prominent, and the magnitude increases from the bottom to the upper distribution. From all independent characteristics, human capital variables, especially education, become prominent for women to help them reduce the wage gap between them and men. In contrast, men favour the sector of segregation to increase the income difference in general.

This study had a policy implication: to enhance access to education and improve human capital through higher education for future gain. Furthermore, the educational investment would be a significantly effective policy for the economy and society. Policymakers should also provide more access to a better-paid sector that remunerates their skills as much as men. This study also had a limitation because the sample selection correction cannot be utilised due to the lack of proper variables in the data. Future research should include sample selection correction to quantify the actual dynamics of the gender wage gap in the labour market.

Acknowledgements

This research was done as a requirement to obtain the Master's degree certificate from the Joint Linkage Program Scholarship of the University of Indonesia and the National Graduates Institute for Policy Studies (GRIPS). The author would like to thank the BAPPENAS or Indonesia's Government National Development Planning Agency for funding this research. The author would also like to extend sincere gratitude to Mr Toshihiro Kudo from GRIPS for his support, guidance, and supervision during the completion of this research.

References

Albrecht, J., Björklund, A., & Vroman, S. (2003). Is there a glass ceiling in Sweden? *Journal of Labor Economics*, *21*(1), 145–177. https://doi.org/10.1086/344126

Arulampalam, W., Booth, A. L., & Bryan, M. L. (2007). Is there a glass ceiling over Europe? Exploring the gender wage gap across the wage distribution. *Industrial and Labor Relations Review*, *60*(2), 163–186. https://doi.org/10.1177/001979390706000201

Becker, G. (1981). *A treatise on the family*. Harvard University Press.

Becker, G. (1985). Human capital, effort, and the sexual division of labor. *Journal of Labor Economics*, *3*(1, part 2), S33–S58.

Blau, F. D., & Kahn, L. M. (2000). Gender differences in pay. *Journal of Economic Perspectives*, *14*(4), 75–99. https://doi.org/10.1257/jep.14.4.75

Blau, F. D., & Kahn, L. M. (2007). The gender wage gap. *The Economists' Voice*, *4*(4). https://doi.org/10.2202/1553-3832.1190

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, *8*(4), 436–455. https://doi.org/10.2307/144855

Bobbitt-Zeher, D. (2007). The gender income gap and the role of education. *Sociology of Education*, *80*(1), 1–22. https://doi.org/10.1177/003804070708000101

Bonnet, C., Jeandidier, B. & Solaz, A. (2018). Wage premium and wage penalty in marriage versus cohabitation. *Revue D'économie Politique*, *128*, 745–775. https://www.cairn-int.info/journal--2018-5-page-745.htm.

Badan Pusat Statistik Indonesia. (2018). Laporan survei pekerja informal (SPIN) 2018. 120.

Chaykowski, R.P., & Powell, L. P. (1999). Women and the labour market: Recent trends and policy issues. *Canadian Public Policy*, *25*, S1–S25. https://doi.org/10.2307/3552314

De la Rica, S., Dolado, J., Llorens, V., Llorens, V., & Dolado Llobregad, J. (2005). Ceiling and floors? Gender wage gaps by education in Spain. DFAE-II WP Series, 1, 1.

England, P., Hermsen, J.M., & Cotter, D.A. (2000). The devaluation of women's work: a comment on Tam. *American Journal of Sociology*, *105*(6), 1741–1751.

Fang, Z., & Sakellariou, C. (2011). A case of sticky floors: Gender wage differentials in Thailand. *Asian Economic Journal*, *25*(1), 35–54. https://doi.org/10.1111/j.1467-8381.2011.02047.x

Firpo, S. P., Fortin, N. M., & Lemieux, T. (2009). Unconditional quantile regressions. *Econometrica*, *77*(3). 953–973. https://doi.org/10.3982/ECTA6822

Firpo, S. P., Fortin, N. M., & Lemieux, T. (2018). Decomposing wage distributions using recentered influence function regressions. *Econometrics*, *6*(2), 1–40. https://doi.org/10.3390/econometrics6020028

Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition methods in economics. *Handbook of Labor Economics*, *4*, 1–102. https://doi.org/10.1016/S0169-7218(11)00407-2

Hegewisch, A., & Liepmann, H. (2013). Occupational segregation and the gender wage gap in the US. In D. M. Figart & T. L. Warnecke (Eds.), *Handbook of Research on Gender and Economic Life*, 200–217. Edward Elgar Publishing. https://doi.org/10.4337/9780857930958.00024

Hennigusnia. (2014). Kesenjangan upah antarjender di Indonesia: Glass ceiling atau sticky floor. *Jurnal Kependudukan Indonesia*, *9*(2), 83–96.

Hewitt, B., Western, M.C., & Baxter, J. (2002). Marriage and money: The impact of marriage on men's and women's earnings. *Discussion Paper DP-007*..

International Labour Organization. (2018). Global wage report 2018/19: What lies behind gender wage gaps. https://www.ilo.org/global/publications/books/WCMS_650553/lang--zh/index.htm

Juhn, C., & McCue, K. (2017). Specialisation then and now: Marriage, children, and the gender earnings gap across cohorts. *Journal of Economic Perspectives, 31*(1), 183–204. https://doi.org/10.1257/jep.31.1.183

Kassenboehmer, S. C., & Sinning, M. G. (2014). Distributional changes in the gender wage gap. *Industrial and Labor Relations Review*, *67*(2), 335–361. https://doi.org/10.1177/001979391406700203

Korenman, S., & Neumark, D. (1991). Does marriage really make men more productive?.

Journal of Human Resources, 26(2), 282–307. https://doi.org/10.2307/145924

Landmesser, J. M. (2019). Decomposition of gender wage gap in poland using counterfactual distribution with sample selection. *Statistics in Transition New Series*, *20*(3), 171–186.

Mardiana, M. (2015). Kesenjangan penghasilan antar gender di Indonesia tahun 2013 dengan metode dekomposisi blinder-oaxaca. *Jurnal Aplikasi Statistika & Komputasi Statistik*, *7*(1), 20. https://doi.org/10.34123/jurnalasks.v7i1.116

McConnell, B., & Valladares-Esteban, A. (2021). On the marriage wage premium.

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, *14*(3), 693–709.

Organisation for Economic Cooperation and Development. (2020). Can collective bargaining help close the gender wage gap for women in non-standard jobs? 1–13.

Psacharopoulos, G., & H. A. Patrinos. (2004). Returns to investment in education: A further update. *Education Economics*, *12*(2), 111–134. https://doi.org/10.1080/0964529042000239140

Pennington, A. (2021). Briefing paper: Women's casual job surge widens gender wage gap. March 1–10. https://australiainstitute.org.au/wp-content/uploads/2021/03/Womens-Casual-Job-Surge-Widens-Gender-Wage-Gap-CFW.pdf

Pirmana, V. (2006). Earnings differential between male-female in Indonesia: Evidence from sakernas data. Center for Economics and Development Studies (Issue 6).

Polachek, S.W. (1987). Occupational segregation and the gender wage gap. *Population Research and Policy Review*, *6*, 47–67. https://doi.org/10.1007/BF00124802

Pooittiwong, A. (2017). Informal workers' gender wage gap across thailand's regions and economic sectors. Chicago Booth: Becker Center on Chicago Price Theory.

Ruzik, A., & Rokicka, M. (2012). The gender wage gap in informal employment in Poland. *CASE Network Studies and Analyses No. 406*, 1–37. https://doi.org/10.2139/ssrn.1674939

Sun, H. Y., & Kim, G. S. (2017). Wage structure determinants and gender wage gap among wage earners: From mean to overall log wage distributional decomposition. *Seoul Journal of Economics*, *30*(1), 93–132.

Taniguchi, K., & Tuwo, A. (2014). New evidence on the gender wage gap in Indonesia. *Asian Development Bank Economics Working Paper Series No. 404*. https://doi.org/10.2139/ssrn.2512096

Tannuri-pianto, M., & Pianto, D. M. (2004). Informal employment in Bolivia: A lost proposition? *World Bank*.

Wei, C., & Li, B. (2007). Glass ceiling or sticky floor? Examining the gender wage gap across the wage distribution in Urban China, 1987-2004. Munich Personal RePEc Archive 3544