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ANALYSIS FACTORS THAT INFLUENCE WAGE DISPARITY BETWEEN FEMALE WORKERS IN URBAN AND RURAL AREAS IN SOUTH SUMATERA

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Abstract

This study aims to analyze the factors that influence wage disparity between working women (female workers) in urban and rural areas in South Sumatera in 2013 using cross-sectional data from Susenas 2013. Methods used in this study are wage equation of Mincer (1994) and wage decomposition model of Blinder-Oaxaca. The results show that average wage disparity between working women in urban and rural areas are 34.93%. This disparity is caused by endowment (independent) variables, namely, education, age, working hours (jam kerja), non-agricultural sector (non-pertanian), marital status (menikah), and the presence of children under the age of five (balita), by 11.82%. The rest of 88.18% are explained by other variables outside this study. Endowment variables such as senior high school (SMA) education, higher education (pendidikantinggi) and working hours (jam kerja) are also found to be the cause of an increase in wage disparity of working women in urban and rural areas.

Keywords: Women Wage Disparity, Endowment Factors, Blinder-Oaxaca, Women Workers

1. Introduction

Women's Labor Force Participation (PAK) in third-world countries have increased dramatically in 1990. Especially for Asian countries, it increased up to 4.3%. However, most of these women work in agricultural sector (80%) or informal sector from 25% to 40% (Todaro, 2000). A similar phenomenon occurred in Indonesia where for over a period of fifty years, the PAK has increased almost two fold.

The level of Women's Labor Force Participation (TPAK) based on 1961's census is 29.35% (Gardiner, 1975) which increased up to 52.44% in 2011 (BPS, 2013). The same case

also occurs in South Sumatera, in 2006, women's TPAK of 53.39% has escalated up to 58.1% in 2013 (BPS, 2013).

This escalation indicates an increasing number of women workers with wage. Although in the household, the wage of women tend to be treated as a side income (secondary sources), the wage is also an important aspect in the household economy (Alwang and Stallman, 1992). Economic factor is one of the factors that cause women to work (Nurlina, 2003). The discrimination to female workers caused their wage to be lower than those received by male workers (Killingsworth, 1991; Todaro, 2000). Wage disparity for female workers does not only occur based on the gender classification but also based on working regions/ areas (Vera-Toscano *et al.* 2004); Findeis and Wang (2004) and Alwang and Stallmann (1992). Wage disparity in woman workers also exist in South Sumatera. Data from Susenas in 2013 shows that average wage for female workers in urban area compared to rural area is Rp25,883.95 to Rp12,497.65 which indicates 48.28% of disparity.

This phenomenon encourages the writer to conduct a research on the wage disparity based on regions (urban and rural areas) for female workers. Similar research has been done by Vera-Toscano *et al.* (2004) that uses panel data and 2 SLS wage model as well as probit model to examine work participation. Findeis and Wang (2004) also conduct a related study using a model of 2 SLS wage with working hours and variable instrument (IV).

Furthermore, Alwang and Stallman (1992) investigate the disparity for married women in the southern part of the United States. The study uses cross-sectional data from Current Population Survey (CPS) in 1979 stressing on labor force demand using Blinders-Oaxaca model which focuses on wage disparity based on decomposition.

This model has been widely used; especially Blinder-Oaxaca model that has been used to investigate wage disparity based on gender (Zajkowska, 2013; Pirmana, 2006) and general income disparity (Su and Hesmati, 2013), Blinder (1973) and Oaxaca (1973). Moreover, some study also analyzes wage disparity using OLS in which regions/areas is served as a dummy variable in independent variable in Mincer's wage equation (Purnastutie *et al.* 2013).

Research on wage disparity for female workers based on working areas (urban and rural areas) using Blinder-Oaxaca model has yet to be conducted; therefore, this study would be a new insight in this research field. The aim of this research is to explain, decomposition ally, factors determining wage disparity for female workers in urban and rural areas in South Sumatera.

2. Literature Review

Numbers of studies have been conducted in investigating wage disparity for female workers in urban and rural areas. Findeis and Wang (2004) undergo similar research in America using panel data. The model used is an equation of 2 sls wage with working hours and instrumental variable (IV). Their findings show 10% and 20% wage disparity in rural and underdeveloped rural areas respectively. Furthermore, they also explain that living costs is accounted for wage disparity for female workers in urban and rural areas in America. Vera-Toscano *et al.* (2004) using panel data and 2 SLS wage model and maximum likelihood, find that wage disparity for female workers based on working areas in Canada is due to experience and the size of the work place.

Alwang and Stallman (1992) investigate wage disparity for working women in the southern part of America. By using cross sectional data from Current Population Survey (CPS) in 1979, they found out that the causes of demand disparity for married women are the presence of children age 7 to 12, spouse's income and the region they live in.

Purnastutie *et al.* (2013) show that the coefficient of urban-rural for women workers is 0.12851 indicating the wage for working women in urban are of Indonesia is higher about 13% compared to those working in rural areas. Furthermore, Su and Hemasti (2013) investigate factors that influence income and its disparity in rural and urban areas in China. By using OLS, quartile regression and decomposition method of Blinders-Oaxaca, they find that individual characteristics especially education and type of job are the factors that accountable for income and its disparity.

Shi et al. (2002) explain that working hours can be accounted for income disparity by 18.67%. Moreover, they also point out that individual characteristics (gender, education, job experience, marriage and health status) can explain the wage disparity in rural and urban areas for 22.75%, which indicates the rest of 77.43% cannot be explained by personal characteristics. Furthermore, it is also found that there is disparity in average living costs between urban and rural areas of 12.91% which is measured by the consumer price index. Primana (2006) shows, decomposition and the income disparity between men and women by 41.6% which is caused by endowment factor and 58.4% caused by unobserved and unexplained factors.

Oaxaca (1973) explores wage disparity based on gender. The result of this study shows wage disparity measured separately for black and white workers: with the difference of 43% for white workers and 49% for black workers. Industry and workers class have the biggest effect on wage disparity based on gender.

Based on the individual characteristics, the magnitude of discrimination of wage discrimination is about 77.7% for white workers and 93.6% for black workers. Blinder (1973) investigates two composition of wage disparity of white/black and man/woman for white people. Wage disparity structurally finds that the biggest influence happens in age variable, education and the condition of local labor market. Men receive higher benefit from education and less likely to be influenced by the condition of local labor market.

In terms of reduction disparity, age contributes totally to wage disparity based on gender and male workers are less likely to be influenced by the condition of local labor market. Furthermore, based on structural analysis by Blinder (1973), it is found that 30.7% of wage disparity between white and black male workers is effected by the factor endowment, while 20.4% is caused by discrimination factor. The same happens to wage disparity between male workers and white women workers, which is influenced by the endowment factor by 15.7% while discrimination factor by 30.1%.

Nurlina (2003) mentions there is a large wage disparity based on the type of business for women farmers who lives around and outside the port area. It is explained that factors that influence the disparity in agricultural sector, namely, traditional cropping pattern, lack of technology, poor irrigation, one season cropping pattern, small land size, the distance from house to garden is quite far and the age of plant is no longer productive. Meanwhile, problems faced for those sectors outside agricultural are the small size of business scale and the lack of working capital.

3. Research Framework

In economics, Mincer's wage equation can be used as the first concept in analyzing wage disparity (Bhatti, 2012; Su and Heshmati, 2013). The equation is as follows:

$$\ln W_i = \beta_0 + \beta_1 X_i + \varepsilon_i \quad (1)$$

where: W_i is monthly wage from individual, X_i is independent variable for individual and ε_i = error term.

In this study, we investigate wage disparity for woman workers in urban and rural areas; therefore, Mincer wage equation is divided into two equations: wage equation for woman workers in urban area and rural area. Systematically, Mincer's equation for urban area is written as follow:

$$\ln W_{Ki} = \beta_0 + \beta_1 X_i^K + \varepsilon_i \quad (2)$$

where: W_{Ki} is monthly wage received by woman workers i living in urban area. X_{Ki} is independent variable for woman worker i living in urban area and ε_i = error term. While for women workers living in rural area, the equation is written as follow:

$$\ln W_{Di} = \beta_0 + \beta_1 X_i^D + \varepsilon_i \quad (3)$$

where: W_{Di} is monthly wage received by woman workers i living in rural areas. X_{Di} is independent variable for woman worker i living in urban area and ε_i = error term.

Independent variables for woman workers include: education, age, working hours, job sector, marital status, and the number of children under the age of 5. Meanwhile, dependent variable is the wage received by the workers in terms of money or items that have been cashed for a month. Age variable is measured based on the length of work during from the previous week. Education variable using dummy variable is grouped into 5 levels: do not graduate from elementary school (basic variable), elementary graduates, junior high school and equivalent graduates, senior high school and equivalent graduates, and higher education graduates.

Job sector variable is also a dummy variable and due to dualistic economics, this variable is divided into two: non-agricultural (1) and agricultural (0). Furthermore, another dummy variable is marital status variable where 1 indicates married and 0 represents other status. The same happens to the number of children below the age of 5 variables. If the worker has children under the age of 5, then the variable is given 1 and 0 is given for others. Table 1 below explains the definition of the variables in details.

Table 1. Operational variable definition

Variable	Definition	Operationality
Wage	Monthly net income (money or item) from main job (Rp).	Transformed into natural logarithm, symbol: $\ln(\text{upah})$
Age	The age of the worker based on their latest birthday.	Transformed into natural logarithm, symbol: $\ln(\text{usia})$
Working Hours	Total working hours in a week (in hours)	Transformed into natural logarithm, symbol: $\ln(\text{jamkerja})$
Education Level	The highest education certificate attained	Category, symbol: pendidikan
SD (Elementary School)	The workers have Elementary School certificate.	1 is given if the workers have elementary school (SD) graduate certificate; 0 if others, symbol: SD
SMP (Junior High School)	The workers have Junior High School certificate.	1 is given if the workers have junior high school (SMP) graduate certificate; 0 if others, symbol: SMP
SMA (Senior High School)	The workers have Senior High School certificate.	1 is given if the workers have senior high school (SMA) graduate certificate; 0 if others, symbol: SMA
Higher Education	The workers have diploma/ undergraduate/ postgraduate certificate.	1 is given if the workers have diploma/undergraduate/postgraduate certificate; 0 if others. Symbol: pendidikantinggi
Job Sector	Main business field of the work place where the workers have work from the previous week	1 is given if the work place is non-agricultural; 0 if agricultural, symbol: non-pertanian
Marital Status	Marriage status	1 is given if the status is married; 0 if others, symbol: menikah
The presence of toddlers	Has children below the age of 5 (toddlers).	1 is given if the workers has children under 5 year old, 0 if others, symbol: memilikibalita
Area Status	Living area status	1 is given if the workers live in urban areas; 0 if they live in rural areas

The limitation of this research is that the wage received has the same definition to those used by BPS (Statistical Bureau), therefore, fringe benefit wage is not included. Furthermore, there are missing data (null) from respondents' answers.

Mincer wage equation is used in Blinder (1973) and Oaxaca (1973) in analyzing the factors that influence wage disparity between working women in urban and rural areas. If Blinder-Oaxaca equation is divided into two groups: explained and unexplained, the model equation would be (Fortin et al. 2010, p.4):

$$\Delta \bar{Y} = \text{Ln } \bar{W}_K - \text{Ln } \bar{W}_D \quad (4)$$

$$\Delta \bar{Y} = [\beta_0^K - \beta_0^D] + \sum_{i=1}^n \bar{X}_i^K (\beta_i^K - \beta_i^D) + \sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] \beta_i^D \quad (5)$$

in which \bar{W} represents average wage in urban (K) and rural (D) area. \bar{X} represents average value of each independent variable in urban (K) and rural (D) area. $\bar{\beta}$ represents average estimation of explanatory variables coefficient through OLS estimation from wage equation. In which, the unexplained group is:

$$[\beta_0^K - \beta_0^D] + \sum_{i=1}^n \bar{X}_i^K (\beta_i^K - \beta_i^D) \quad (6)$$

While, explained group is:

$$\sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] \beta_i^D \quad (7)$$

If Blinder Oaxaca is decomposed into three groups: endowment, coefficient and interaction, the Blinder Oaxaca equation would be (Hlavac, 2014):

$$\Delta \bar{Y} = \sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] \beta_i^D + \sum_{i=1}^n \bar{X}_i^D (\beta_i^K - \beta_i^D) + \sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] (\beta_i^K - \beta_i^D) \quad (8)$$

In which, the endowment group is:

$$\sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] \beta_i^D \quad (9)$$

Coefficient group is:

$$\sum_{i=1}^n \bar{X}_i^D (\beta_i^K - \beta_i^D) \quad (10)$$

Interaction group is:

$$\sum_{i=1}^n [\bar{X}_i^K - \bar{X}_i^D] (\beta_i^K - \beta_i^D) \quad (11)$$

4. Data

The appropriate data used in this study is obtained from Susenas 2013 (BPS, 2014). In this study, the sample is limited to working women in South Sumatera who receive wage. Total data of 1855 consist of 987 working women in urban area and 868 working women in rural area.

Due to data limitation of only including those women who receive wage, therefore bias selection test will be tested in this study (Comola and Mello, 2009). There are many steps in bias selection test, Heckman (1979) points out two steps for this test. The first step consist of estimating the working probability using probit model, if Inverse Mills ratio (lambda) is significant, then the second step can be undertaken in which the ratio (lamda) is used as explanatory variable (Purnastutie et al. 2013). In this study, the coefficient of inverse mills ratio after the estimation using probit model of working probability is 45,2723 and insignificant at $\alpha = 0,05$. This indicates there is no error of sample selection bias and OLS can be used.

Table 2 shows the average value of each variable used. It can be seen that the variable with the highest disparity is non-agricultural sector variable (0,356) followed by (ln) upahvariable (0.3000). Furthermore, it followed by jam kerja variable (0.191), menikah (0.131) dan SMA (0.129). Meanwhile, variables that have the lowest disparity are SMP (0.001), followed by Ln usia (0.05) and the presence of children under the age of 5 (0.08).

Negative disparity values indicating the average wage from the variable is higher in rural areas compared to urban areas.

Table 2. Average variable between working women in urban and rural areas

Variable	Urban Area	Rural Area	Disparity
Ln Upah	13.883	13.532	0.300
SD	0.129	0.243	-0.114
SMP	0.096	0.097	-0.001
SMA	0.326	0.197	0.129
PendidikanTinggi	0.354	0.241	0.113
Ln usia	3.487	3.536	-0.049
Ln jam kerja	3.571	3.380	0.191
Non pertanian	0.849	0.493	0.356
Menikah	0.566	0.697	-0.131
Memilikibalita	0.1996	0.279	-0.08
N	987	868	

According to Table 2, the width of disparity of variable lnupah between working women in urban and rural area is 0.300 per month in 2003. This implies that there is a disparity between working women in urban and rural areas in South Sumatera of 34.93%.

5. Results

The first step is to compare the groups based on OLS estimation results from the wage equation of working women as explained in Table 3. Based on Table 3, it can be seen that the highest wage disparity between working women in urban and rural areas is affected by three variables: Senior High School (SMA) education, higher education (*pendidikantinggi*) and non-agricultural factor (*non-pertanian*). For senior high school (SMA), education variable has the highest disparity of 0.315 (1.058 to 0.743). The second variable with the highest disparity is higher education with 0.217 of disparity (1.499 vs. 1.282). Followed by non-agricultural (non-pertanian), elementary school (SD) education, junior high school (SMP) education, age (usia), working hours (jam kerja), the presence of children under the age of 5 (balita), and marital status (menikah) with the disparity of 0.25, 0.13, 0.127, 0.115, 0.155 and 0.089, respectively. For balita and menikah variables, the disparity is low since both of variables are insignificance at $\alpha = 0.05$. However, this value is the highest estimation value in rural area since these variables are significance in rural area at $\alpha = 0.05$.

Decomposition model of Blinder-Oaxaca (2008) is used to see the factors that influence wage disparity between working women by decomposition. Stata.13 is used in the data processing procedure. To analyze these factors, wage equation of Mincerian is still used.

The result analysis of Blinder-Oaxaca can be seen from Table 4 below. Table 4 shows the estimation of the average wage from lnupah equation is 13.83134 and 13.53173 for working women in urban and rural areas, respectively.

This indicates that the total wage disparity is 0.2996014 that represent the scale of logarithm. According to Table 4, exponential number of parameter estimation indicates that average of monthly wage for working women in urban area is Rp 1.069.962.32, compared to Rp752.931.85. This indicates the wage disparity between the two areas is 34.93%.

Generally, it can be concluded that the wage disparity is affected by endowment factor, which is influenced by the independent variables, such as age, working hours, elementary school education, junior high school education, senior high school education, and higher education by 11.82%. The rest of 88.18% is caused by the unexplained variables, which are outside independent variables.

Table 3. The estimated value of wage equation for working women in South Sumatera

Variable Independent	Urban B	Stand Error	p> It l	Rural β	Stand Error	p> It l
SD	0.190	0.092	0.040	0.203	0.078	0.009
SMP	0.458	0.101	0.000	0.331	0.105	0.002
SMA	1.058	0.086	0.000	0.743	0.101	0.000
Pendidikantinggi	1.499	0.082	0.000	1.282	0.103	0.000
Ln usia	0.734	0.077	0.000	0.619	0.091	0.000
Ln jam kerja	0.397	0.036	0.000	0.282	0.039	0.000
Non-pertanian	-0.106	0.062	0.090	-0.356	0.077	0.000
Menikah	0.078	0.056	0.168	0.085	0.064	0.181
Balita	-0.021	0.059	0.725	-0.110	0.065	0.090
N	987			868		
R ²	0.4343			0.2617		

Table 4. Blinder-Oaxaca decomposition analysis of working women based on urban and rural areas in South Sumatera

Category Disparity	Ln Scale of Parameter Estimation	Standard Error	Exponential of Parameter Estimation
(1)	(2)	(3)	(4)
Perkotaan	13.83134	0.02844	1069962.327.-
Pedesaan	13.53173	0.02992	752931.8498.-
Total Perbedaan	0.2996014	0.04186	1.3493
Dekomposisi			
Endowment	0.1117292	0.0305925	1.11821
Koefisien	0.0219324	0.0425461	1.02217
Intraksi	0.1659398	0.0342735	1.18050

In details, the relationship between endowment factor and wage disparity can be seen from Table 5. According to the table, variables that are significantly affected endowment are working hours, age, elementary school (SD) education, senior high school (SMA) education, higher education, and job sector. In another hand, variables that are found to be insignificant are junior high school (SMP) education, marital status and the number of children (who are under 5 years old).

Junior high school (SMP) education is found to be insignificant due to the small number of working women who graduate from junior high school (SMP) and this number is relatively equal between urban and rural areas.

Furthermore, marital status is found to be insignificant due to economic factor. This is caused by the need to complement the high living costs leading the women to work for additional income. In terms of the number of children under the age of 5, this is also found to be insignificant because the children are being taken care of by family member or professional caretaker. Further, it is also found that some women take care of their children while working. Therefore, the existence of children does not affect their working hours.

Moreover, by using urban area as the comparison in decomposition, significant variables can be identified. Coefficient signs of endowment (positive or negative) are used to identify whether wage disparity exists. Positive sign of endowment disparity (benefit for working women in urban areas) indicating working women in urban areas have higher endowment compared to those working in rural area since it widen the wage disparity. Meanwhile, the

negative sign shows the endowment for working women in rural areas is higher than in urban area and this will lessen the wage disparity.

Table 5. Analysis endowment variables on Blinder-Oaxaca decomposition model that influence wage disparity on woman workers based on urban and rural areas in South Sumatera

No	Variable	Parameter Estimation	Standard Error	Z	P> z
(1)	(2)	(3)	(4)	(5)	(6)
1	Ln_jamkerja	0.05378	0.11297	4.76	0.000
2	Ln_usia	-0.0300	0.10797	-2.78	0.005
3	SD	-0.0232	0.00961	-2.42	0.015
4	SMP	-0.00017	0.00455	-0.04	0.970
5	SMA	0.09598	0.01985	4.84	0.000
6	Dikti	0.14459	0.02933	4.93	0.000
7	Non-Pertanian	-0.12675	0.0283	-4.48	0.000
8	Status menikah	-0.01116	0.00855	-1.30	0.192
9	Balita	0.00874	0.00560	1.56	0.119

Notes: (+) sign shows advantages received by working women in urban area
 (-) sign shows advantages received by working women in rural area

In this study, there are three endowment variables that give benefit to women workers in urban area, namely: working hour, senior high school (SMA) education, and higher education. This means that these variables are accountable for wage disparity for working women in urban and rural areas. The highest endowment value is senior high school (SMA) education with 0.09598 while the working hours are the lowest value with 0.05378.

Wage disparity is assumed affected by senior high school education (SMA) and higher education due to education access for the citizen in rural areas especially for women. Especially for higher education, its inexistence in rural areas is the main reason of why the society does not pursue higher education. Although recently higher education is more accessible in districts, its ratio is still inadequate for the society. High costs and parent's permission for girls to move to another city are found to be the constraint of pursuing higher education for women.

The same goes to senior high school (SMA) education variable. The low number of senior high school (SMA) in rural areas lead to low opportunity for the society especially women to continue their study. Moreover, the ratio of senior high school to junior high school in rural areas is still unequal which cause students who graduate from junior high school (SMP) difficult to continue to senior high school (SMA). Private school also cannot accommodate junior high school (SMP) graduates in rural areas. Furthermore, school facilities in rural areas are still behind compared to those in urban area: complete school facilities in urban areas help to improve the quality of graduates from senior high school (SMA) in urban areas.

Even though government has made it obligatory for 12 years of education, the education facilities in rural areas are still inadequate. This also influenced by the financial condition of the area. 'One roof' school system that has been developed is an appropriate to this problem however it needs to be maximize especially for the enhancement of instructor quality in rural area.

In addition, small number of job variation and high number of agricultural job (non-formal sector) are assumed as the cause of women workers with graduate certificate of senior high school (SMA) and higher education are very little absorbed in positions that correspond to their education.

Government program helps small medium need to be maximized especially in rural areas. The same goes to the provision of the facilities in order to increase the agricultural and non-agricultural based of industrial sector growth in rural areas.

Wage disparities for women in urban and rural areas are affected by the following variables:

1. The number of job type in urban area lead to high opportunity for women workers to vary their jobs.

2. The existence of professional work in urban area -low working hours with high income-lead to higher average wage in urban area compared to rural area.

6. Conclusion

From the previous discussion, the conclusions are as follows:

- 34.93% is accounted as wage disparity between working-women in urban and rural areas in South Sumatera.
- Factors that influence wage disparity by decomposition between working women in urban and rural areas can be explained by endowment factor of 11.82% while the rest of 88.18% is explained by other factors that are not investigated in this study.
- Endowment factors that lead to wage disparity between working-women in urban and rural areas in South Sumatera are senior high school (SMA) education, higher education and working hours.

Based on the previous results and discussions, our suggestions are as follows:

- In order to equate education facilities between the two areas, it is suggested to the government to build more education facilities in form of senior high school (SMA) in rural areas that will equate the high number of junior high school (SMP). This is expected for girls/women in rural areas have the same opportunity as those in urban areas to continue their study to senior high school (SMA). The same goes to higher education to be built in district capital to increase the accessibility for those women in rural areas to pursue their higher education.
- Government through related institutions is expected to be more serious to drive the growth of industries in rural areas by providing means of support.
- For future research, it is suggested to investigate more on factors that influence wage disparity between working women in urban and rural areas in South Sumatera by including bring benefit wage in their study.
- For working women, we suggest to always try to enhance their skills through training or other source of information.

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