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Original article

Occupational Segregation Based on Gender and Wage Inequality by Education, Age and Mobility (South Sumatra, Indonesia)

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Abstract

Purpose: *this study measures gender segregation by occupations and wage inequality based on overall segregation, vertical segregation, and horizontal segregation in terms of labour supply, namely differences in wages, hours of work, age, level of education, and mobility (rural and urban) in South Sumatra Province in 2019.*

Methods: *the data used in this study are secondary data sourced from the 2019 South Sumatra Province Labour Force Survey (SAK19.AK) which is limited to individuals aged 15 to 64 who are currently working, namely as many as 10,429 individuals, of whom 6,873 men and 3,556 women. Classification of the main occupations using quantitative analysis techniques, namely measuring segregation is based on the overall, vertical and horizontal dimensions based on the Gini coefficient, Somer D Statistic, and Pythagorean Theorem.*

Results: *(1) Women are more segregated based on the main occupations, especially jobs with high social stratification and wage groups. (2) Women have more advantages in workplaces with low social stratification and higher education categories. (3) There is no wage inequality based on the main occupations, education, age, and mobility.*

Conclusions and Relevance: *the results of the study prove that there is high segregation based on wage groups and educational composition. Women emphasize increasing education because based on vertical segregation, women with higher education level advantage more and they occupy jobs that are equal to men based on wage stratification.*

Keywords: *Occupational Segregation, Wage Inequality, Gender Gap, Education, Age, Mobility*

Conflict of Interes. *The authors declare that there is no Conflict of Interest.*

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Оригинальная статья

Профессиональная сегрегация по признакам пола и неравенства в оплате труда в разбивке по образованию, возрасту и мобильности (Южная Суматра, Индонезия)

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Аннотация

Цель данного исследования – измерение гендерной сегрегации по профессиям и неравенству в оплате труда в провинции Южная Суматра в 2019 г. на основе общей, вертикальной и горизонтальной сегрегации с точки зрения предложения рабочей силы, а именно, различий в заработной плате, продолжительности рабочего времени, в возрасте, уровне образования и мобильности (в сельской и городской местности) респондентов.

Методы или методология проведения работы. Представленное исследование базируется на вторичном анализе информации, полученной в результате обследования рабочей силы в провинции Южная Суматра 2019 г. (SAK19.AK), включающего данные о работающих на указанный момент лицах в возрасте от 15-ти до 64-х лет – всего 10 429 человек, в том числе 6873 мужчин и 3556 женщин. Классификация основных профессий выполнена с использованием методов количественного анализа, а именно, исследование сегрегации опирается на общие, вертикальные и горизонтальные измерения на основе коэффициента Джини, статистики Somer D и теоремы Пифагора.

Результаты работы. (1) Женщины региона более сегрегированы по признаку основного занятия, особенно в профессиях с высоким социальным расслоением и по группам заработной платы. (2) Женщины имеют больше преимуществ на рабочих местах с низким социальным расслоением и в категории высшего образования. (3) Не присутствует неравенства в оплате труда по основным профессиям, образованию, возрасту и мобильности.

Выводы. Результаты исследования доказывают, что существует высокая сегрегация по группам заработной платы и образования. Женщины уделяют особое внимание повышению уровня образования, поскольку на основе вертикальной сегрегации выявлено, что женщины с более высоким уровнем образования получают больше преимуществ и занимают рабочие места, равные с мужчинами, в зависимости от стратификации заработной платы.

Ключевые слова: профессиональная сегрегация, неравенство в оплате труда, гендерный разрыв, образование, возраст, мобильность

Конфликт интересов. Авторы заявляют об отсутствии конфликта интересов.

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Introduction

The economic condition of South Sumatra Province is experiencing a positive trend, based on an increase in the GDP growth rate during the 2016–2018, but in 2020 the growth rate has decreased to -1,24 percent. Even though there has been a decline, economic growth in South Sumatra Province is the highest on the island of Sumatra, at an average of 4.21 percent (Indonesian Statistics Agency, 2020b). The high average economic growth is inseparable from the sectoral growth rate. Bank of Indonesia (2020) states that the mining and quarrying sector, as well as the wholesale and retail trade sectors, are sectors that support economic growth. It is consistent with this that the labor structure is distributed in these sectors, especially in the agricultural sector which supports employment (BPS Provinsi Sumatera Selatan, 2019). Varied labor patterns have an impact on segregation in occupations, especially jobs that are specified by gender (Blau et al., 2013). In line with this, the problem of segregation has been discussed in various literature studies, especially related to segregation based on demographic characteristics, especially the grouping of women and men in certain occupations (Mandel, 2018; 2013). This pattern of segregation is also discussed by Yunisvita & Muhyiddin (2020), who define the regional segregation as a structure of gender inequality segregation (Blackburn et al., 2001). Based on the findings of Busch (2020), it explains that

gender inequality is evidenced by women who are perfectly segregated in the labor market. Consistent with this, Silber (2012) explains that segregation can be considered an inequality in men and women's distribution in various occupations. The gender segregation pattern is largely determined by the extent to which women participate in the labor market because segregation consists of two levels. The first level is when women are discriminated against in the labor market, and the second is when women and men in the labor market are separated into different jobs (Anker et al., 2003). Meanwhile, according to Gedikli (2020) increasing female labor force participation is considered as the indirect way to create a job structure because the occupations are inseparable from gender conditions in occupying certain jobs. This condition is inseparable from a significant and dynamic increase in job opportunity growth, especially in areas that are still developing (Akbulut, 2011). In line with this, the employment phenomenon in South Sumatra Province is still dominated by men and leads to a gender gap in the labor market (Indonesian Statistics Agency, 2020a).

During the 2016–2020, the labor force participation rate in South Sumatra Province had been fluctuated. but in the past 4 years, there was registered a decrease in TPAK in the Province by an average of 69.26 percent. This decrease has an impact on the Labor Force Participation Rate (LFR) for both men and

women, which has seen a decrease over the past 4 years with an average of 83.9 percent for men and 54.2 percent for women. Although this labor force trend for both women and men as well as the total trend has decreased, it is clear that there is a relatively high gap between male and female LFR, where men still dominate in the workforce in the province during the last 5 years (Badan Pusat Statistik Indonesia, 2020a). The condition of the workforce based on the main occupations in South Sumatra Province in 2016–2020 proportionally shows that women dominate in the occupations with a higher percentage than men, namely Professionals, Technicians, and Similar / Professionals at 10.9 percent. Sales worker amounted to 21.7 percent and Service Worker – by 7.6 percent. Meanwhile, men have a higher percentage than women in this occupations namely Agriculture, Forestry, hunting and Fishing workers and laborers by 48.48 percent and Production workers, Machinery Operations Workers by 26.03 percent. Overall, it shows the highest percentage of both men and women in the workforce in agriculture, forestry, hunting and fishing workers and laborers, while the lowest are managerial and supervisory occupations. This condition illustrates that a small proportion of female and male workers occupy jobs in occupations that have a decent level of wages and working hours, namely managerial and supervisory occupations – on average only 1.63 percent for men and even female workers only amounting to the last 0.8 percent (Badan Pusat Statistik Indonesia, 2020).

This condition illustrates that female and male workers in occupations that do not require high education and skills considering that the lowest labor distribution is in the job qualifications that have this category, namely leadership and management personnel on average only 1, 54 percent for male and even female workers amounted to only 0.46 percent. This empirical condition is consistent with Razavi et al. (2012) who found that there was strong job segregation, where women were separated into seasonal/temporary jobs with low wages and unsatisfactory working conditions, while men occupied several permanent jobs in these sectors. In contrast to the case with several countries in the vertical segregation analysis, it is found out that women started to have a greater tendency to hold more prestigious jobs and high-status jobs than men (Gedikli, 2020; Blackburn et al., 2001; Jarman et al., 2012).

Some research differences related to vertical segregation are revealed by Blackburn et al. (2002) which reveal that this difference occurs due to countries that place the status of women on a par with men and even higher, which is proven to increase gender segregation. In contrast, countries that place the status of women below men tend to have lower segregation. A broader study by Kacprzak (2014) discusses

vertical segregation in several aspects including age, education, marital status, number, and occupation. In contrast to Gedikli (2020) who explains the vertical component of segregation is based on differences in wages, working hours, and age categories in various occupations. Vertical segregation based on wage differences is also revealed by Jarman et al. (2012) who found that in the case of developed countries the level of male advantage is much lower than that of women, this is evidenced by the lower value of women's vertical segregation.

Apart from vertical segregation, differences also occur in horizontal segregation as revealed by Gedikli (2020) with the results of the study that the integration of women is very low in the labor market. This is also evidenced by Emerek et al. (2003) who found that there was a positive difference between the level of women's employment and the segregation of occupations (for example, a relatively lower rate of gender segregation by occupations is characterized by lower employment rates for women). The results of this study contrast with that of Rafnsdóttir & Weigt (2019) who found that the integration of women and men is the same in the labor market because integration is determined by aspects of education and job risks.

In particular, this study is different from previous studies in analysing segregation by occupations in all job classifications based on differences in wages, hours of work, age, education classification, and area classification (urban and rural) using the approach taken by Blackburn et al. (2001). namely analysing the overall differences in the occupations in the distribution of men and women (overall occupational segregation) and the inherent gap in this pattern, namely the difference in wages in the distribution of men and women across jobs (vertical segregation). As well as the horizontal dimension, which is the orthogonal value of vertical segregation that measures differences regardless of gender gaps (Hakim, 1979; 1992).

Literature Review

Segregation by sex most commonly emphasizes the preferences of workers and firms. Hypothetically, the roles of men and women encourage division in domestic workplaces in general. Men choose jobs that maximize income, and women choose jobs that support childcare so that segregation leads to preferences that are differentiated by sex (England, 1992). Men's self-interest also hypothetically drives them to exclude women from "men's jobs". Universally, the specific assumptions related to gender preferences are limited by the preferences themselves, because the theoretical preferences vary not by sex but by separation of occupations based on sex (Reskin, 2001). In addition, segregation based on gender will determine the level of respect for wages, independence, prestige, and productivity which should

minimize gender disparities. Explanations that focus on employer preferences stem from gender bias and attempts to minimize job costs through statistical discrimination are limited by their emphasis on motives that are difficult to measure. As a result rationally, employers' influence on segregation is based on the occupations because they provide certain gender based jobs. However, the existence of training, *turn-over costs*, and skills leads to women's discrimination and segregation of gender based occupations (Reskin, 2001). Bielby & Baron (1986) show that companies often discriminate against women by incorporating the stereotypical characteristics of individuals including of their sex, but this is very contrary to the neoclassical economic theory, and this practice is considered inefficient and irrational. The concept of gender segregation in employment has been used widely and is useful. Several literature reviews discuss gender disparities in employment (Charles & Bradley, 2002; Hakim, 1979; 1992). However, the frequently used concept of segregation is misinterpreted and used to explain the concentration of the proportion of the workforce, a different aspect of the pattern of employment by gender. While concentration is a measure of the proportion of one sex, usually women's segregation in one job or in a series of jobs measures the tendency of men and women to be employed in jobs that are different from one another.

Blackburn et al. (2001) explains that segregation measures the separation of women and men as a proportion of the workforce, or a specific share of one of them, such as all full-time workers. The important thing to remember is that unlike the concentration measure the segregation is symmetrical. This means that if men are separated from women in a workforce structure, then women are also being separated at the same level as men. If everyone was employed in the same job, there would be no separation. On the other hand, if there are no jobs that employ men and women, there will be total segregation. For example, if all men were employed as equipment makers and all women as equipment cleaners or vice versa, if everyone in the workforce had a different job, there would be total segregation. In practice, of course, the degree of separation lies between these two extremes. Thus, the segregation index used in empirical research ranges between 0 and 1 in representing the degree of segregation in the labor force, or a specific share of one workforce (often, but not necessarily the national labor force), with 1 representing total segregation and 0 representing the total not integrated workforce. There are many approaches to calculate occupational segregation, including (Duncan & Duncan, 1955) the usage of the *index of dissimilarity* and the Karmel MacLachlan Index (IP) (Karmel & MacLachlan, 1988), and (Gedikli, 2020; Jarman et al., 2012; Blackburn, 2009; Blackburn et al., 2001; Semuonov & Jones, 1999).

The discussion on segregation is summarized in several literature studies, including Bettio & Verashchagina (2009). They used the approach of the *IP index* and found that occupational segregation is still relatively high, reaching 25.3% for occupational segregation and 18.3% for sectoral segregation. There is a fairly rapid difference in segregation among countries with a difference of about 10 points in percentage between the most and the least segregated. The same approach was studied by Yunisvita & Muhyidin (2020) who found that the segregation of occupations in rural areas according to the gender was still integrated because the D-index value was close to 1. While based on the Pearson correlation coefficient, it is known that occupational segregation by sex has a significant relationship, very strong and negative percentage of women in the workforce and age, while the opposite direction is with the difference in the percentage of women and men who have high school education and above. Consistent with this, Herrera et al. (2019) found that most of the wage gap cannot be explained and is often caused by social norms, discrimination, or unobservable differences in productivity. The results show that the largest gender wage gap and the highest level of occupational segregation are located in the rural / Agrawal areas (2016) using overall and local occupational segregation instruments. The results of the study found that occupational segregation by gender and social groups was higher in the urban sector than in the rural sector. Women are more segregated than men in both sectors. Among the social groups, different caste and definite ethnic groups there is a higher level of segregation. Furthermore, this study found that permanent workers and older people have a high level of segregation based on job characteristics and age groups.

A different approach was taken by Burchell et al. (2014) with a new methodology for measuring segregation which found that patterns of gender segregation in employment differed significantly in each country. Alonso-villar & Río's (2016) different analysis of occupational segregation by the level of education proves that African-American women with multiple colleges or university degrees have lower segregation compared to those with less education. In America the gender-based occupational segregation by analysing low-wage groups was carried out by Gradín (2020) who found that job segregation was very high, female workers represented low-paying jobs.

Horizontal segregation in the occupations and its effect on vertical segregation. This study found that job transitions based on gender have both vertical and horizontal relationships where the gender influence is reversed where more and more women leave the occupations *untyped*. The findings also show that horizontal gender-based movements will significantly reduce employment status for women. Consistent

with this, Blackburn et al. (2016) based on a vertical analysis found that men almost always advantage, while the advantage class status belongs to women.

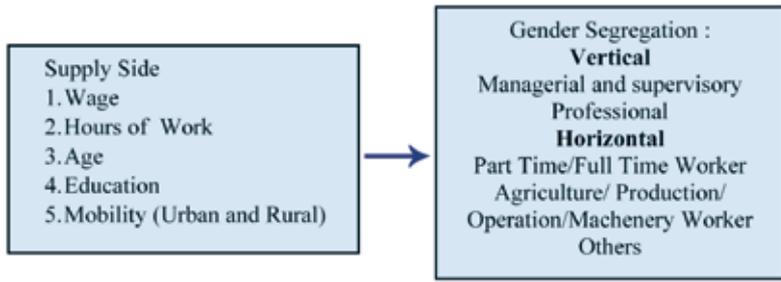
Ljunggren & Andersen (2015) studied a different pattern of vertical segregation by classifying the age group of children aged 13-15 years who found that there was segregation between the upper class and lower-class workers. In addition, there was also a moderate and slightly increased degree of horizontal segregation between upper-class factions based on culture and economy. The same study conducted by Jarman et al. (2012) found that women and men tend to work in different jobs in general, this is considered detrimental to women. Based on the case, some developed countries tend to advantage men over women in terms of wages. Consistent with Lane (2017) who finds that occupational segregation by gender contributes to the wage gap because female-dominated jobs are paid the lower wages overall than male-dominated jobs both historically and in the current study. This study estimates that a segment of occupation accounts for one-third to 40 percent of the wage gap. This condition applies to jobs that are dominated by women at each low, medium, and high skills level which is associated with lower-median income than jobs that are dominated by men. Although several cases show a disadvantage for women in terms of wages, the Busch study (2020) found that female workers who have high experience, education, and skills provide wage advantages for women. The same pattern analysed by Strawinski et al. (2018) found that the highest wages of men and women in jobs require the highest level of education and investment in work (leadership and professional). Sağlamer et al. (2018) shows some negative trends in the level of education of women, this can be seen from a slowdown in the number of female academics, as well as a lower concentration of female academic scores. This phenomenon will have an impact on the position of women in certain occupations, with higher education, the occupations represented by women will tend to be at the same wage level as men and even higher. Vuorinen-Lampila (2016) found that men can get permanent and full-time jobs easier than women, and men achieve better correspondence between their titles and their jobs.

Banerjee (2014) found that lower wages received by women cannot be explained by gender differences. However, occupational segregation can be seen based on gender, which impacts lower income for women compared to men. Women are represented in predominantly male jobs, and the feminization of work has a negative impact on women's earnings. Even after considering various individual and occupational characteristics and the gender composition of occupations, a large number of genders pay gaps remain unexplained. Job segregation in the industrial

sector analysed by Campos-Soria & Roperó-García (2016) found that the main part of the contribution of gender segregation was not explained by differences in the characteristics studied. In addition, estimates suggest that the educational advantages of women have helped narrow the gender pay gap caused by job segregation in each company only for groups of workers with the lowest educational requirements. In line with Hesmondhalgh & Baker (2015) reveals that there is high job segregation between women and men where women have a supporting role and good communication while men are more creative and innovative, thus this aspect differentiates their wages according to the occupations specified. Furthermore Bertogg et al. (2020) segregation also occurs in the recruitment process for this occupation, the findings prove that female applicants have lower recruitment compared to male applicants.

A follow-up study that discusses structural changes, in particular, the improvement of the service sector which will increase the participation of women forces which will affect the occupations of women in the future (see Akbulut, 2011; Fan & Lui, 2003; Ngai & Petrongolo, 2017). Specific summaries of occupational segregation based on gender can be referred to in various scopes of study including (Baker & Cornelson, 2018; del Río & Alonso-Villar, 2019; Qian & Fan, 2019; Rafnsdóttir & Weigt, 2019; Wixe & Pettersson, 2020). Referring to the measurement of vertical segregation by Blackburn et al. (2001) and several literature reviews that discuss gender disparities in employment (Charles & Bradley, 2002; Hakim, 1979; 1992). Then a conceptual framework is built as follows.

Fig. 1 explains job segregation based on gender from the labor supply side. Labour supply causes segregation of occupations based on gender as a whole. Conceptually, the overall occupational segregation produces segregation dimensions, namely vertical and horizontal segregation which discusses segregation based on labor supply variables including wages, hours of work, age, education, and area of residence (rural and urban). This variable will determine the degree of segregation based on the occupations. Many studies discussing the segregation of occupations from the supply side of labor, including Gedikli (2020), which discusses segregation based on vertical and horizontal dimensions based on differences in wages, hours of work, and age, with research results showing that women are consistently at a disadvantage compared to men. Men have a higher gap when the vertical dimension is measured with a social stratification scale other than wages, namely working hours and age. In other words, women tend to be in lower-paying jobs than men and their chances of being hired in lower-ranking jobs across the social hierarchy tend to be higher. In line with this, horizontal segregation is higher than vertical segregation.



Source: Compiled by the authors.

Fig. 1. Framework Conceptual

Источник: Составлено авторами.

Рис. 1. Концептуальная основа исследования

Meanwhile, segregation based on education level was studied by Busch (2020) who found that the level of education would reduce the gender gap, where women with higher education levels tended to be integrated with occupations with higher wages, even if the occupations were the same as men. Job segregation based on wage differences based on vertical dimensions was discussed by Blackburn et al. (2001). In general, this study finds that based on the vertical component, women who work full-time advantage more than women who work part-time, even though they face losses in terms of wages, women who advantage of men working in manual labor in terms of social stratification. Meanwhile, Yunisvita & Muhyiddin (2020) discussed segregation based on rural areas who found that all rural areas showed a relatively high level of segregation.

Materials and Methods

This research discusses the segregation of occupations based on gender including vertical and horizontal dimensions in terms of labor supply, namely differences in wages, hours of work, age, education level, and mobility (rural and urban) in each district/city covering 13 districts and 4 cities in South Sumatra Province in 2019. The data used in this study are secondary data obtained from the Central Statistics Agency (BPS) of South Sumatra Province which is raw data sourced from the 2019 South Sumatra Province Labor Force Survey (SAK19.AK). This research data is limited to individuals aged 15 to 64 years who are currently working, namely as many as 10,429 individuals, of whom 6,873 men and 3,556 women are classified in the main occupations coded in the two digits of the 2002 Indonesian Standard Classification of Position (KBJI) covering 8 job categories, namely (1) Professionals, Technicians, and Similar / Professional (2) Leadership and Management Staff (3) Administration Personnel (4) Sales Business Personnel (5) Service Business Personnel (6) Agricultural, Forestry Business Personnel, Hunting and Fisheries (7) Production Per-

sonnel, Transport Equipment Operators, and Rough Workers (8) Other Personnel.

The analysis technique used is quantitative which refers to the approach Blackburn et al. (2001) conceptualized two dimensions of segregation, namely vertical, which describes the gap, and horizontal orthogonal, which describes the distribution of work. These two dimensions will form the overall segregation of jobs. The measurement of occupational segregation is measured using the Gini coefficient approach to mea-

sure the overall segregation of jobs and Somers D to measure the vertical segregation of jobs.

(Gedikli, 2020; Jarman et al., 2012; Blackburn, 2009; Blackburn et al., 2001; Semuonov & Jones, 1999) describes the calculation of the Gini coefficient with the following equation:

$$G = \sum_{i=2}^n \left[\sum_1^{i-1} L_t/P \sum_1^i L_t/P - \sum_1^i P_t/P \sum_1^{i-1} L_t/P \right] \quad (1)$$

Where n is the total number of jobs and indicate the occupations, i and t show the occupations included in the cumulative total. P_i and L_i show the number of women and men in job t, respectively, and P_i and L_i respectively, show women and men in job I, while P and L show the total number of women and men in the workforce. The measurement of the Gini coefficient is simplified by Blackburn et al. (2001) with the following mathematical equation:

$$G = [1/LP] \sum_{i=2}^n \left[\sum_1^{i-1} P_t \left(\sum_1^{i-1} (L_t + L_i) \right) - \left(\sum_1^{i-1} (P_t + P_i) \right) \sum_1^{i-1} L_t \right] \quad (2)$$

$$G = [1/LP] \sum_{i=2}^n \left(L_t \sum_1^{i-1} P_t - P_i \sum_1^{i-1} L_t \right) \quad (3)$$

The formula the Gini coefficient can interpret as a description of two data sets of men and women based on the gender composition (qualities of women/men) of their occupations (Blackburn et al., 2001). Based on Gedikli (2020) approach, C represents the number of all pairs that are ordered "consistently" and D represents the number of pairs that are "inconsistent". In this case, C includes all male and female partners in which female occupations have a higher proportion of male workers than fe-

male occupations. *D* includes all male and female partners in which female occupations have a higher proportion of female workers than male occupations. So that the mathematical equation of the Gini coefficient becomes:

$$G = (C - D) / PL \tag{4}$$

Where =

$$C = \sum_{i=2}^n \left(L_t \sum_1^{i-1} P_t \right) \text{ dan } D = \sum_{i=2}^n \left(P_t \sum_1^{i-1} L_t \right) \tag{5}$$

The Somers *D* value explains that the independent variable has only two values, namely male and female. The maximum value of *D* for the set of occupations is based on gender distribution because the order based on the distribution of women is the same as the ratio of men. Therefore, Somers *D* describes the occupations ordered along a vertical dimension giving a vertical size corresponding to *G* as the measure of overall segregation. Finally, the size of the horizontal segregation conceptualized as orthogonal values to the vertical compo-

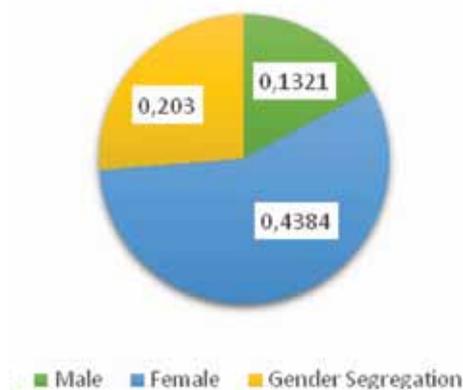
nent, horizontal segregation is calculated using the Pythagorean theorem as follows:

$$\text{Horizontal Segregation} = \sqrt{[(\text{Overall Segregation})^2 - (\text{Vertical Segregation})^2]} \tag{6}$$

Horizontal segregation represents the residual association between gender and structure occupations as well as gender differences in terms of criteria where vertical segregation is identified.

Results

The segregation analysis based on the main occupations summarizes the overall segregation conditions based on the main occupations according to gender classifications including several determining components, namely working hours, age, education, and area of residence. Overall segregation analysis using the calculation of the overall segregation index using the Gini coefficient approach using equation (1), the following can be seen the results of the calculation of the gender segregation index (Fig. 2).

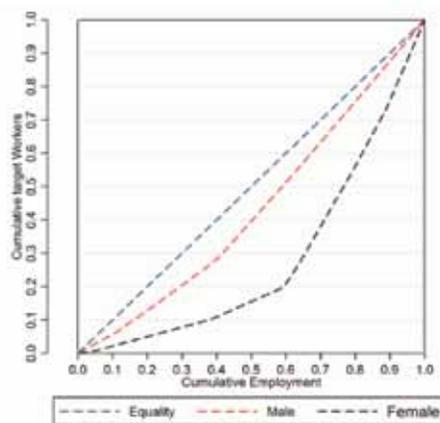


Source: Compiled by the authors.

Fig. 2. Overall Segregation Based on Gender

Источник: Составлено авторами.

Рис. 2. Общая сегрегация по половому признаку



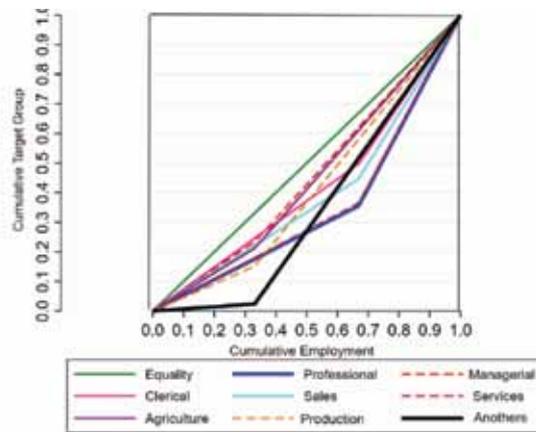
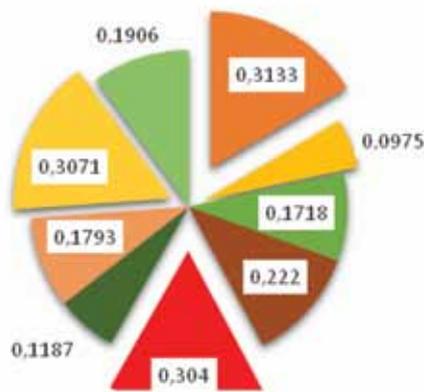
The gender segregation index as a whole shows that women have a higher segregation value, women are more segregated in certain occupations than men, therefore the local male segregation curve is lower than the female segregation curve. This is shown in the curve with the red stripe showing the cumulative workforce of women and the curve in the black line which shows the cumulative figure of men. Thus the occupational segregation of female workers is higher than that of men.

Fig. 3 explains that the overall segregation value based on the main occupations is categorized as

low but there are several occupations that are higher than the total segregation value, namely Professionals, Technicians, and Similar / Professionals (0.31), Service Business Workers (0.307) and Other Personnel. (0.304). Meanwhile, the occupations that have the lowest segregation value are Leadership and Management Personnel (0.0975), Agricultural, Forestry, Hunting, and Fishery Business Personnel (0.118), and Administrative Personnel (0.718). The local segregation curve explains the cumulative underrepresented target which in this case is the main occupations, it can be seen that the main occupations

with the highest segregation index is the occupations for professionals, service workers, and other workers which shows the line furthest from point 0 or line of equivalence. This condition represents that women's representation in this occupation is low. Based on the social stratification, the occupations of professionals and other workers have a high social stratification, based on descriptive analysis which shows that professionals and other workers have high wage categories. This shows that this occupation consistently depicts women's representation in these occupations, in line with the persistence of discrimination against women in this occupation which results in fewer female workers competing with men. In contrast to the occupations of leadership and management personnel, it shows that women are integrated into decent

work. The integration of women in work, which can be seen from the cumulative value of workers that is close to 0 or close to the equality line, namely the occupations of leadership personnel, the distribution of women in this occupation is not much different from that of men, namely by 0.3 percent. It can be concluded that women can compete with men in the occupations with the highest social stratification in the job hierarchy. Furthermore, the integration of women is in the occupations of agricultural, forestry, hunting, and fishery business workers. This is in line with the relatively high proportion of women, who dominate the overall total number of working women workers, namely 7.7 percent, thus the representation of women in the types of agricultural business work.



Source: Compiled by the authors.

Fig. 3. Overall Segregation Based on Occupational

Источник: Составлено авторами.

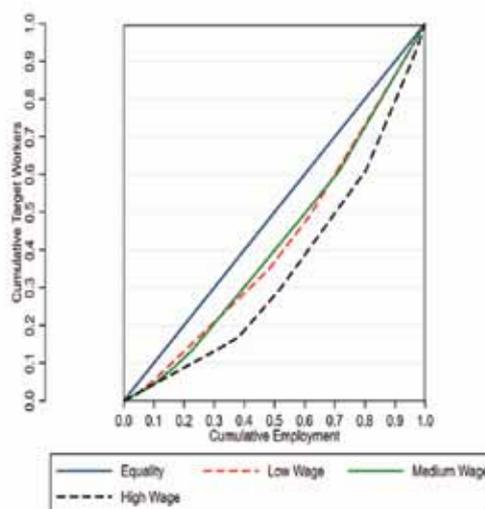
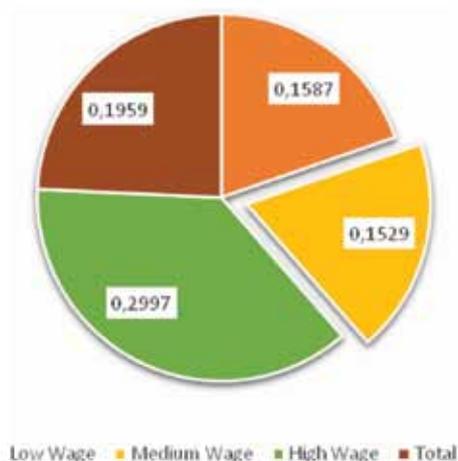
Рис. 3. Общая сегрегация по признаку профессиональной принадлежности

Gender segregation by wage groups a measurement in this study is based on the wage cluster using descriptive statistical analysis (quartile), namely dividing wages into three groups, the low wage group ($\geq 800,000$), the medium wage group ($\geq 1,500,000$), and the high wage group ($\geq 2,600,000$). The case of gender segregation based on wage groups can be seen from the Gini coefficient value in Fig. 4. Empirically the research proves that there is a relatively high difference in value of segregation between male and female workers based on wage groups. This case can be analysed based on the segregation of wage groups based on the classification of the main occupations which shows whether women are integrated or segregated in jobs which have low wage groups, medium wage groups, and high wage groups. Generally the segregation value of the whole wage has a

segregation value of 0.1959. This condition explains that there is segregation based on wage groups, especially in the high wage category. The local segregation curve explains the target group in the wage category, which as a whole proves that each wage category shows relatively high segregation seen from the cumulative of workers in all high group wage categories that move away from the equality line, so it can be interpreted that workers are separated into different wage groups in each occupation with high average wages. The measurement of wage segregation is analysed in detail using the overall segregation approach, vertical and horizontal segregation with a differentiating component, namely wages based on the highest average working hours, which calculates segregation in both overall, vertical and horizontal dimensions based on the number of workers with the

highest wage group and working hours. Based on the previous analysis, it is evident that the level of segregation is higher in the high wage group. The position of women at the level of work with the highest wage rate according to working hours is explained in the whole segregation analysis, be it as a whole, vertically, or horizontally. The vertical dimension is measured by the components of wages and hours of work which show that the overall value of vertical segregation is positive (0.183 based on the highest monthly wage

rate according to working hours) which indicates the position of men advantages in terms of wages and hours of work. In other words, women are more likely to be employed in jobs with lower wages and hours of work. However, the values for the horizontal dimensions are much higher than for the vertical dimensions. Thus, the overall condition of segregation is caused by differences in the pattern of men's and women's work across jobs rather than inequality (measured by wages according to working hours).



Source: Compiled by the authors.

Fig. 4. Overall Segregation Based on Wage Group

Источник: Составлено авторами.

Рис. 4. Общая сегрегация по группам заработной платы

Table 1 shows that women are disadvantaged in jobs with high social stratification, this evidence also explains the position of women who are disadvantaged in the highest job hierarchy. This can be explained by the positive value of vertical segregation, namely the occupations of Managerial and supervisory occupations and other in which this job category has the highest average wage compared to other occupations. Meanwhile, the opposite condition shows that women advantage from jobs that have low social characteristics, such as Production workers, operation of machinery workers and Agricultural, Forestry, Hunting and Fishery workers and laborers. This proves that women occupy unsuitable jobs, which are jobs that are dominated by men. The suitability of women's jobs can be seen in the advantages of the occupations, namely Professional, technician and related occupations, Clerical and related occupations and sales worker. Overall, it can

be concluded that men tend to have an advantage in terms of wage rates where men occupy jobs that have high social stratification in terms of wage rates and working hours. This condition illustrates the difference in employment patterns, wage inequality that is not explained because the value of the horizontal dimension is greater than that of vertical segregation. Meanwhile, the position of women in terms of age composition shows that women are disadvantaged in all age compositions except for the 20–29 years age category which shows a negative vertical dimension value that describes the advantages of women in the age composition with that category. The overall review shows that the values for the vertical dimensions are lower than the values for the horizontal dimensions. Thus, based on the age composition, it cannot describe the condition of inequality, but this can be illustrated based on the pattern of differences in work based on the age composition. In detail, the segrega-

Overall, Vertical and Horizontal Segregation by Occupational
Общая, вертикальная и горизонтальная сегрегация по профессиям

Table 1

Таблица 1

Occupational	Overall Segregation	Vertical Segregation	Horizontal Segregation
Professional, technician and related occupations	0.3291	-0.069	0.324
Managerial and supervisory occupations	0.0961	0.155	0.072
Clerical and related occupations	0.2123	-0.076	0.207
Sales worker	0.1839	-0.095	0.175
Services worker	0.1441	-0.047	0.142
Agriculture, forestry, hunting and fishing workers and laborers	0.1251	-0.007	0.125
Production workers, operation of machinery workers	0.1663	-0.043	0.164
Others	0.206	0.040	0.204
Total	0.183	0.053	0.180

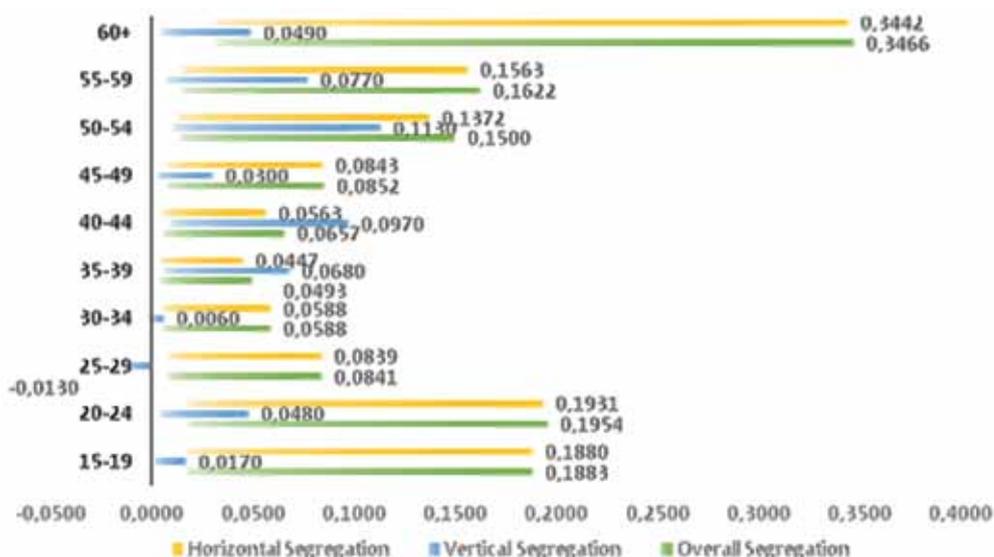
Source: BPS South Sumatera, 2019 (processed).

Источник: BPS South Sumatera, 2019 (обработанные данные).

tion conditions can be seen in terms of overall dimensions, vertical dimensions, and horizontal dimensions which can be seen in Fig. 5.

Based on Fig. 5, shows that men advantage as a whole based on the composition of age, the advantages of men are seen from the highest vertical dimension value which is located in the elderly age category in the age category (elderly), namely 50-54 years (0.113) and 55-59 years (0,0770). Meanwhile,

the category middle age is the 40–44 year age category (0.0970). Meanwhile, the opposite condition is described in the middle age category which has the lowest vertical dimension value that is 30–34 years (0.006), the age category (0.017) is 15–19 years old and the elderly category (elderly) is 45–49 years (0.030). This condition can be concluded that there are differences in the variation of male and female advantage in terms of wages according to the highest working hours based on the age composition.



Source: Compiled by the authors.

Fig. 5. Overall, Vertical and Horizontal Segregation by Age Group

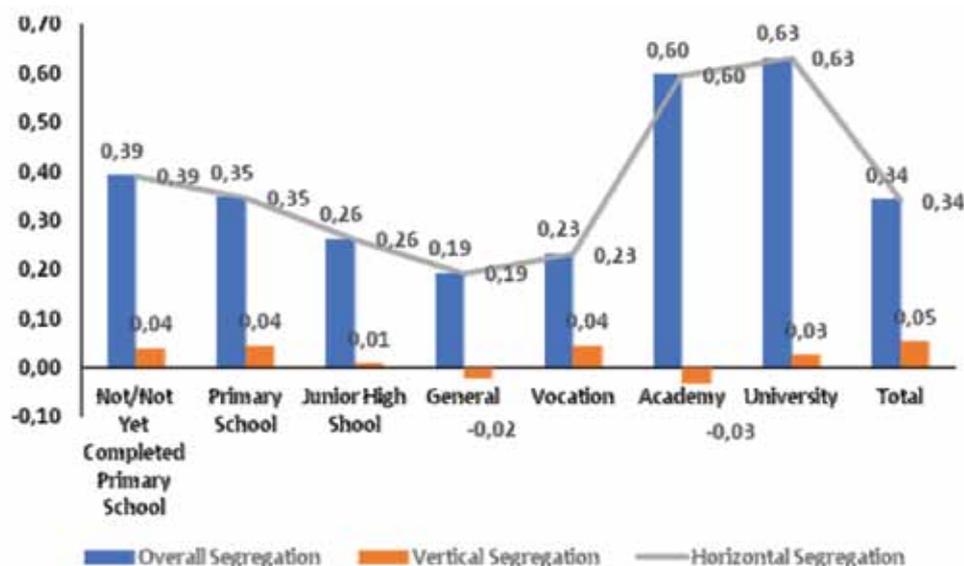
Источник: Составлено авторами.

Рис. 5. Общая, вертикальная и горизонтальная сегрегация по возрастным группам

The composition of education is measured based on the conditions of segregation which are described based on the overall dimension, vertical and horizontal dimensions. This difference will explain the advantage level of both men and women in terms of the monthly wage rate according to the highest average working hours based on the level of education.

Fig. 6 explains that based on the level of education, women advantage from the high school and academy categories. The advantage in terms of wages is

seen from the negative vertical dimensions General (-0.020) and Academy (-0.032). The condition of segregation based on the vertical dimension shows that generally, men advantage in terms of wages based on low, middle, and high education levels. An interesting condition here is that the highest advantage level for men in terms of wages lies in the primary school education category, which is 0.044 and the lowest advantage is shown in the junior high school education category (0.008).



Source: Compiled by the authors.

Fig. 6. Overall, Vertical and Horizontal Segregation by Education Group

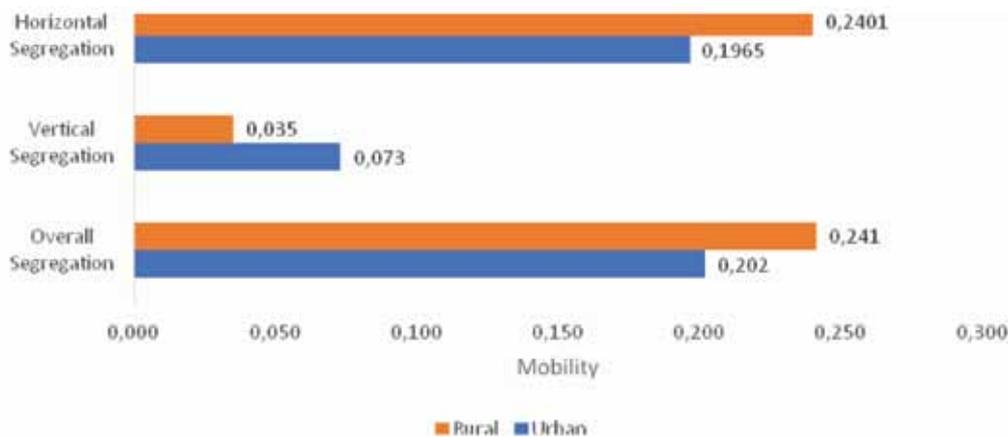
Источник: Составлено авторами.

Рис. 6. Общая, вертикальная и горизонтальная сегрегация по группам образования

Meanwhile, men's gain in terms of wages based on the level of university education is 0.025. This condition can be concluded that based on the higher education category, women and men advantage in terms of wage levels. The value of the vertical dimension in all education categories which is lower than the value of the horizontal dimension illustrates that this condition cannot prove the existence of inequality between workers based on the level of wages according to the education category, but this value illustrates the difference in work patterns based on education level. In addition, based on the overall segregation index, it shows that the overall segregation value is relatively high in the higher education category, namely Academy (0.598) and University (0.631).

The difference in wages based on mobility is described based on the conditions of segregation based on overall dimensions, vertical dimensions, and horizontal dimensions. In detail, the conditions for wage differences are described in Fig. 7.

Overall based on Mobility shown in Fig. 7 which explains that men advantage more based on the mobility where overall men advantage both in urban and rural areas. Based on the horizontal dimension, it shows that there is no inequality based on the wage component in terms of the area of residence, this proof is based on the value of the vertical dimension which is lower than the horizontal dimension which illustrates the pattern of differences in work based on the area of residence. The highest male advantage in terms of wages lies in urban areas with a vertical dimension value of 0.073 compared to rural areas which show a lower value of 0.035. Thus, it can be concluded that based on the vertical and horizontal dimensions it proves that men overall are more profitable based on the monthly wage rate according to the average working hours both in urban and rural areas, overall inequality based on wage levels cannot be explained but it can be explained that there are differences in patterns workers by area of residence.



Source: Compiled by the authors.

Fig. 7. Overall, Vertical and Horizontal Segregation by Mobility (Urban – Rural)

Источник: Составлено авторами.

Рис. 7. Общая, вертикальная и горизонтальная сегрегация по мобильности (город – село)

The estimation results based on the overall segregation condition show that the under-representation of women or women is more separated based on the main occupations, wage group, working hours, education level, and age group. Based on the case, the main occupations of workers are more segregated in jobs with a high average wage or jobs with high social stratification such as professionals, other workers, and service business workers. This is in line with the study of Gedikli (2020) who proves that the level of segregation is high in occupations with high social stratification. The same condition was revealed by Salardi (2016) who found that overall gender was separated based on the composition of jobs with high social stratification. Further evidence is related to the wage group where the results of the study found that the high level of segregation is based on the high wage group, this proves that the occupational segregation with high wage rates. Consistent with this, the study by Strawinski et al. (2018) found that there is a high wage gap based on the composition of high wages, which is based on the composition of workers' wages that are more segregated, especially women who tend to be integrated into occupations based on low wage groups. In line with this, Jarman et al. (2012) found that a high level of segregation based on wage groups is associated with social stratification in the occupations. Inequality in wages of workers is measured based on the overall dimension, vertical and horizontal dimensions in terms of the wage component and working hours with a high category.

The results of this study indicate that the overall value of vertical segregation is positive, which explains the position of men who advantage in terms of wages. Thus, women have a higher tendency to be employed in jobs with lower wage rates. This is also evidenced by the

value of the vertical dimension which has a negative value, this explains that women have an advantage in the occupations with low wages such as agricultural, forestry, hunting and fishery business workers and production workers, transportation equipment operators and rough workers. Meanwhile, men advantage from occupations with high social stratification, namely Leadership and Management Personnel and Other Personnel. This is in line with research (Gedikli 2020; Charles & Bradley, 2002; Blackburn et al., 2001; Hakim, 1979; 1992) which found that based on the vertical dimension it proves that women are disadvantaged in occupations with high wage rates. The condition of wage inequality is not proven in this study in terms of the value of the horizontal dimension which is higher than the vertical dimension, which means that the overall segregation is caused by differences in male and female employment patterns across jobs rather than inequality (measured by wages and working hours). This condition is in line with research (Gedikli, 2020; Borrowman & Klasen, 2020; Herrera et al., 2019; Jarman et al., 2012; Blackburn et al., 2001) which explains that gender disparities are not proven based on wage differences. Inequality in wages in terms of education level shows that based on the level of education, women advantage from the high school and academy categories as evidenced by the negative value of the vertical dimension. This condition is supported by a study by Busch (2020) which finds that the level of education will reduce the gender gap, where women with educational levels advantage from occupations with higher wages, even if this occupation is the same as for men. This is in line with the case of segregation based on the main occupations where the difference in wages cannot be proven based on the education category.

Based on the age group, the male advantaged as a whole based on the age composition based on the elderly age category (*elderly*), namely the age category and the middle age category. The results of this study are consistent with Alonso-villar (2015), who proves that men are more advantaged from the underage age category. This study is reinforced by the results of Gedikli's (2020) study which found that men advantaged more from the overall age composition. The same condition is evidenced by the area of residence whereas the total, overall men's advantage based on the area of residence both in urban and rural areas. The results of this study have not proven the difference in wages based on age category and area of residence, which is consistently supported by the study of Schaner & Das (2016) who reveals that this difference only illustrates the pattern of differences in occupations, but it does not prove that there is a gender gap based on wage differences.

Conclusion

This study focuses on conditions of segregation and inequality of workers' wages in South Sumatra Province based on overall, vertical, and horizontal dimensions in terms of eight main occupations. The results of the study found that women are more segregated based on the main occupations and wages. The condition of wage inequality based on vertical and horizontal dimensions proves that women are more profitable in occupations with low social stratification or women are more advantaged based on the occupations with a low wage rate. Meanwhile, in terms of education level, women advantage from the higher education category. The results of the study found that wage disparities based on the type of the main occupation, age education, and area of residence were not proven or could not be explained because the differences only represented a pattern of occupational differences, and not determined by the level of wages. Further recommendations relate to future research which should consider more than eight job categories so that wage differences are evident and the variations in advantages for men and women are specifically described based on the more varied occupations.

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