Determinants of Commuter Worker Income in South Sulawesi during the Covid-19 Pandemic

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Abstract

The development and ease of access to transportation in South Sulawesi Province opens up opportunities for the workforce to work in areas that are administratively different from their residence as commuters. Commuter workers tend to increase every year. When Covid-19 hit the economy in Indonesia, te government issued various policies to suppress the spread of the Covid-19 virus. One of them is by implementing Large-Scale Social Restrictions (PSBB) which was also adapted by the South Sulawesi Provincial Government. The impact of the Covid-19 pandemic on commuter workers is still not a concern, especially even though the restrictions on economic and social activities have a significant impact on the working hours and income of commuter workers. This study determines the factors that affect the income of commuter workers during the Covid-19 pandemic. Based on the results of the August 2020 National Labor Force Survey (Sakernas) data processing, it shows that the income received by commuter workers during the Covid-19 pandemic is influenced by the variables of working hours, business fields, employment status, policies for implementing Work from Home, education level and gender.

Keywords: covid-19; commuter worker; working hour; income

Introduction

Regional conditions in Indonesia provide different mobility patterns among regions. The decrease in residential land in urban areas, accompanied by high house prices and the cost of living as well as improvements in transportation facilities, in turn are able to change the pattern of mobility that occurs. Coupled with the wider geographical boundaries of the distribution of employment, the easier ownership of motorized vehicles and the variety of transportation facilities have a relatively large contribution to the process of worker mobility. This accessibility then changes the mobility pattern to be non-permanent, either circular or commuting (Tambunan et al., 2014).

In Indonesia, the number of commuter workers increases every year. The dense number of vehicles that occur in the morning around the time of starting work and in the afternoon until the evening around the time of returning illustrates the commuting phenomenon (BPS, 2019). This commuting also opens up opportunities for the workforce to work in areas that are administratively different from where they live (Frizalda, 2016).
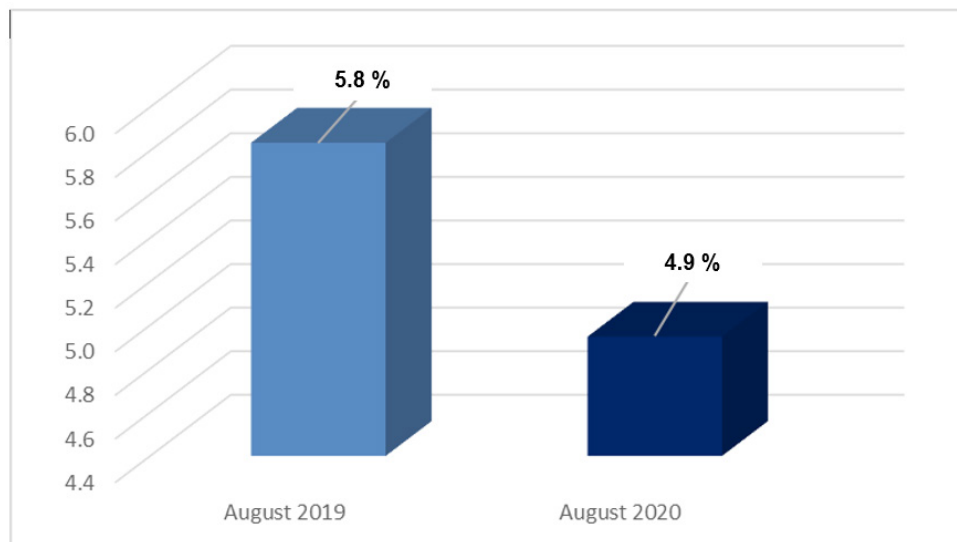
Source: Sakernas 2020, processed data

Figure 1. Percentage of Commuting Workers in South Sulawesi

This convenience also encourages women who are generally second breadwinners in the household to work without forgetting their role as homemakers (Hong, Lee, & McDonald, 2018; Kawabata & Abe, 2018). This phenomenon of commuter workers occurs not only in Greater Jakarta (Jakarta, Bogor, Depok, Tangerang, and Bekasi) but also in several metropolitan areas such as in Medan (Medan, Binjai and Deliserdang), Sarbagita (Denpasar, Badung, Gianyar, and Tabanan) and Mamminasata. (Makassar, Maros, Gowa and Takalar). Even the Mamminasata metropolitan area is an area with a high commuting rate (BPS, 2020a).

When Covid-19 emerged at the end of 2019, which then spread to various parts of the world and hit the economy in all countries, including Indonesia. It carried various policies out to reduce the spread of the Covid-19 virus. One of them is by implementing Large-Scale Social Restrictions (PSBB) which are carried out per region according to the severity of the outbreak (Muhyiddin, 2020). The Indonesian government's strategy is to limit various activities in the workplace and public places, limit transportation modes and other activities. The Provincial Government South Sulawesi also issued regulation on social restrictions.

Based on the Governor Regulation Number 22/2020 concerning Guidelines for Implementing Large-Scale Social Restrictions in Handling Corona Virus Disease 2019 in the Province of South Sulawesi, the community activities include the temporal suspension of activities at schools and workplaces, temporal suspension of religious activities in houses of worship or certain places, restrictions on activities in public places, temporal cessation of socio-cultural activities that cause crowds of people, and restrictions on transportation modes. The government also emphasized the difference between PSBB and regional quarantine, where people may not do activities outside their homes.

The magnitude of the unemployment rate measured the impact of Covid-19 on employment but also impacts reducing working hours and temporarily not working (Dewi, Magdalena, Ariska, Setiyawati, & Rumboirusi, 2020). The International Labor Organization estimates that with social

distancing adopted worldwide affecting nearly 2.7 billion workers or about 81 percent of the world's workforce, globally working hours will fall by 6.7 percent in the second quarter of 2020, which is equivalent to 195 million full-time workers. These restrictions directly affect the activities of workers, especially commuter workers, placing them at high risk of losing their jobs and income (ILO, 2020). In line with the ILO report, there has been a decline in the number of commuter workers in South Sulawesi. Figure 1 shows that commuter workers in 2019 reached 5.8 percent of total workers, while in 2020 there was a decline in the number of commuters to 4.9 percent of total workers in South Sulawesi.

Google records information about individual mobility based on individual data that activates location history on Google Maps. Google Mobility Index which describes the percentage change in the number or duration of visits in various categories of places relative to normal days (baseline days). Google noted a spike in decreased activity in the workplace environment. Figure 2 shows the decline in activity at work at around 40 percent below the baseline. Meanwhile, there was an increase in place duration of up to 20 percent above the baseline. In general, the WFH policy is quite effective in reducing the rate of mobility in the office or workplace. During the transition to the new normal stage, activity at work increased until it was in the range of 20 percent below the baseline. The decrease in activity in the workplace is very high only on holidays.

Restrictions on activities in the workplace encourage workplaces to implement a Work from Home (WFH) policy. Changes in mobility patterns also followed the implementation of WFH. Mobility at work decreases while mobility at home increases (BPS, 2020b). The impact of the spread of Covid-19, one of which was the implementation of social restrictions and the Work from Home (WFH) policy in mid-March 2020, caused the trend of community mobility to change.

The ability to apply a work from home policy cannot be done in many work. Gottlieb, Grobovsek, Poschke and Saltiel (2020) in their research in several developing countries found that the application of work from home was very low in service and sales jobs, as well as in the manufacturing sector. They also found that workers with low levels of education and asset ownership were less likely to work from home. What is interesting in this study is that workers who can work from home earn an average income of almost double the amount received by the business sector that is closed because of restrictions on economic activity. Similar results are shown by research conducted by Adams-Prassl et al. (2020) in the United States, United Kingdom and Germany, showing that workers who are able to do more tasks from home have lower chances of losing their jobs.

Kedir and Mckay (2005) conducted a study in Ethiopia, stating that workers in the formal sector have a tendency to receive higher incomes and a higher probability of getting out of poverty when compared to workers in the informal sector. Workers in the formal sector in Indonesia receive more stable incomes and higher wages than informal workers. A Japanese study looking at the effects of COVID-19 on workers found that low-skilled and informal workers suffer more than highly skilled workers who receive regular incomes (Kikuchi, Kitao, & Mikoshiba, 2020).
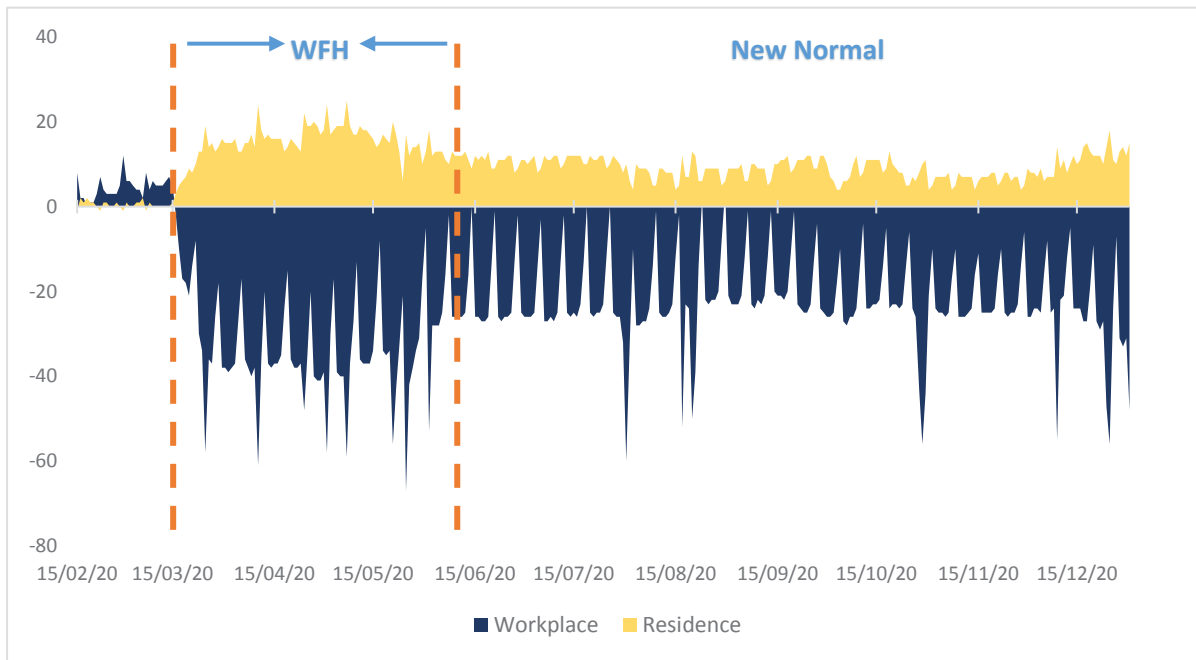
Source: Google Mobility Index

Figure 2. Trade-Off Mobility at Work and Residence Period 15 February -31 December
2020 in South Sulawesi Province

The COVID-19 pandemic has widened the gap in labor market inequalities as a burden on vulnerable groups, including people of color, women, migrant workers, older employees and the less educated disproportionately (Yueping, Hantao, Xiao-yuan, & Zhili, 2021). Research on the impact of the Covid-19 pandemic in the United States, United Kingdom and Germany shows female workers are significantly more likely to lose their jobs than men, and when viewed from the level of education, workers who graduate from university are more likely to stay in their jobs (Adams-Prassl et al., 2020).

Stereotypes are recorded in people's minds that women are only identical to domestic or household activities. Most of the household responsibilities, such as time spent on house production and childcare, continue to be carried out by women. The existence of a "dual role" for women, namely as breadwinners and homemakers, causes women who work to be more sensitive to distance than men. Women's sensitivity

to distance from home to various work locations will play a role in occupational segregation of women (Hanson & Johnston, 1985). Women's lower incomes and their concentration in female-dominated jobs explain shorter distances to work than men (Iwata & Tamada, 2014).

Working hours also affect commuter mobility. Workers with longer commute times will increase their weekly working hours by increasing the daily labor supply (Gutiérrez-i-Puigarnau & van Ommeren, 2010). A similar study was conducted by Sultana and Weber (2014) which showed that working hours have a significant influence on working commuters. These commuter workers are at risk of experiencing a decrease in working hours, which will ultimately impact income. A similar study conducted in Australia in 2020 showed that there was a reduction in the number of hours worked and even commuters lost their jobs (Beck & Hensher, 2020; Hensher, Wei, Beck, & Balbontin, 2021).

This study aims to determine the factors that affect the income of commuter workers during the Covid-19 pandemic. Many studies have explored the impact of the Covid-19 pandemic on employment, especially for commuter workers, but they are still very limited in developing countries. This study also aims to contribute to adding references to commuter workers.

Research Methods

The data used in this study is the 2020 National Labor Force Survey (Sakernas) of South Sulawesi Province, conducted by the Central Statistics Agency. The sample of Sakernas 2020 is population aged 15 years and over. The sample used in this study was workers who did round-trip mobility. Unit of analysis for commuter workers whose workplaces differ administratively at the district or city level. In the morning go to work, in the afternoon go home again. The boundaries of residence used in this study are districts or cities.

The concept of working uses the concept used in the 2020 Sakernas which has accommodated the 13th International Conference of Labor Statistician (ICLS). Work is doing work intending to earn or helping to earn income or profit for at least one hour (uninterrupted) or for one cumulative hour in the past week, including those who are temporarily not working.

Information related to work activities in the questionnaire can be found in question 9. a regarding the activities of the past week "In the last week, did you work?"; detail 9.b "In the past week, have you carried out any activities to earn income/income/money?" and details 9.c "In the past week, did you help with business activities or with family/other people's work?" and details 10.a "Do you actually have a job/business activity, but in the last week you were not working/not running the business?". To filter the unit of analysis that performs commuting,

information from question 19.b is used, namely "Where is your location/place of work in your primary job in the last week?" if you are in the same province as your place of residence but your district/city differs from your place of residence and question 19.c, namely "Do you travel back and forth from your home/place of residence to the office/workplace regularly?" if the answer is every day on the same day, then it is included in the research sample.

Descriptive analysis is used to summarize the variables used in this study based on the results of cross tabulation between variables and based on graphs. Inferential analysis is used to determine the effect of independent variables on the dependent variable. In this case, the inferential analysis method used is a linear regression model. Linear regression analysis method is an analytical method that describes the relationship between a response variable and one or more independent variables.

In this study, it included income as the dependent variable in the model. Income is income/wage/net salary as money received by commuter workers who worked for the past month from their primary job, both as money and goods. The independent variables used are gender, education level, number of hours worked from primary job, Work from Home policy at work, main job status, and main job field.

The gender variable is the sex of the commuter workers, which is defined as coded 0 is male and coded 1 is female. Variable Education level is the level of education completed by commuter workers, which is categorized as code 0 if the highest education is junior high school or the equivalent or below; coded 1 if the highest education completed is high school or equivalent; and coded 2 if the highest education completed is a diploma and above.

The number of hours worked is the length of work in hours used by commuter workers to work from their primary job, excluding rest hours during the past week.

It then defined the number of hours worked as follows, coded 0 if the number of hours worked is less than 35 hours a week; coded 1 if the number of working hours is at least 35 hours in a week.

The Work from Home (WFH) policy variable is the implementation of the work from a home policy that was carried out in the workplace during the past week. The WFH policy is defined as follows, coded 0 if the workplace does not implement WFH; and coded 1 if the workplace applies WFH.

The next independent variable used is the main job status. I grouped employment status into two categories, namely formal and informal. The formal category includes workers/employees/employees with permanent employers and trying to be assisted by permanent workers/paid workers. Meanwhile, informal includes those who work alone, those who work with the help of family members, and unpaid workers, trying to be assisted by non-permanent workers, casual workers in agriculture, free workers in non-agricultural activities. It then defined this variable as follows, coded 0 if the employment status is formal; and coded 1 if the employment status is informal.

Business field is a field of activity from the work/business/company/office where you work, or those produced by the company/office where you work. In this study, I categorized business fields into three groups, namely the agricultural sector, the manufacturing sector and the service sector. Code 0 if the business field is in the agricultural sector; code 1 if the business field is in the manufacturing sector; and code 2 if the business field is in the service sector.

The model used in this study is:

$$Y = \beta_{10} + \beta_{11} X_1 + \beta_{12} X_2 + \beta_{13} X_{3\ldots\ldots\ldots} + \beta_{1k} X_k$$

Parameter testing uses two types of tests, namely the F test and t test. The F test statistic is also called the simultaneous test, it is used to determine the effect of all independent variables in the model together (Basuki & Prawoto, 2015). The hypothesis used in the F test is:

$$H_0 = \beta_{11} = \beta_{12} = \beta_{13} = \cdots = \beta_{jk} = 0$$
$$H_1 = s there\ is\ at\ least\ one\ \beta_{jk} \neq 0$$

with F test statistics = $\frac{ESS/(k-1)}{RSS/(n-k)}$

where n = number of observations and k = number of estimation parameters, including intercept or constant.

The second test is a partial test for each independent variable using the t test. The hypothesis used in the t test is:

$$H_0 = \beta_{jk} = 0$$
$$H_0 = \beta_{jk} \neq 0$$

(there is an effect of the independent variable jk with the dependent variable)

with t test statistics = $\frac{\hat{\beta}_k - \beta_k}{se\ \hat{\beta}_k}$

Discussion

Changes in Working Hours and Income of Commuter Workers

The Mamminasata metropolitan area (Makassar-Maros-Sungguminasa-Takalar) is located in South Sulawesi Province, with Makassar City as the city center. Sungguminasa is the capital of Gowa Regency. The administrative areas covered by the Mamminasata metropolitan area are Takalar Regency, Gowa Regency, Maros Regency and Makassar City. Most of the commuter workers who commute to Makassar come from Gowa. The close distance may be the reason for the workers to commute from Gowa to Makassar. In addition, the price of houses in Gowa Regency, which is relatively cheaper than Makassar City, is also a consideration for households that prefer to live in Gowa and work in Makassar.
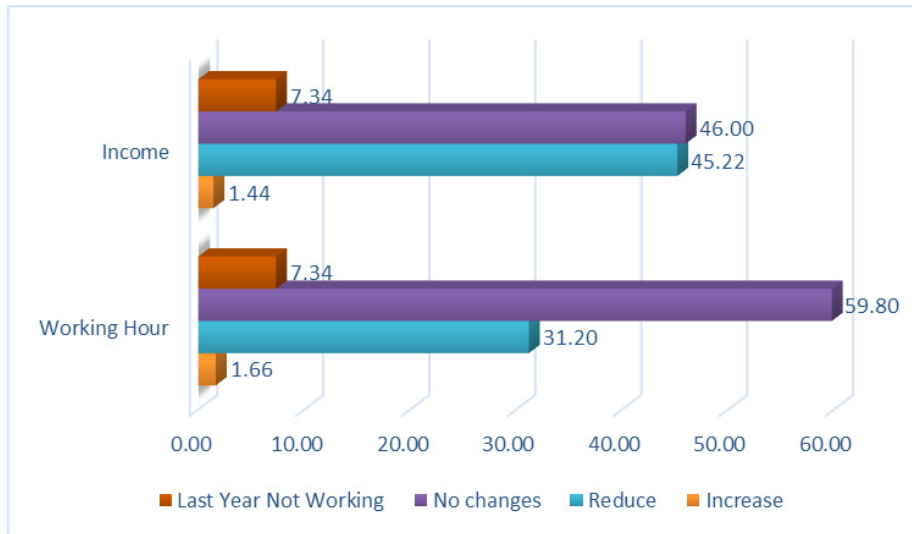
Source: Sakernas 2020, processed data

Figure 3. Changes in Working Hours and Income Experienced by Commuting Workers in South Sulawesi

One disruption in employment due to the Covid-19 pandemic is workers who are temporarily out of work. The large-scale social restrictions imposed in South Sulawesi are the main reason commuter workers are temporarily out of work. Implementing restrictions on community mobility also reduces company productivity, which results in reduced company operations and reduced income received by workers.

Figure 3 shows 31.20 percent of commuter workers in South Sulawesi it reduced whose working hours in August 2020 when compared to February 2020 before the Covid-19 outbreak in Indonesia. This is in line with the ILO's prediction that the Covid-19 pandemic will reduce the number of hours worked. Besides, in Figure 3 we can see that there are 45.67 percent of commuter workers whose income it reduced when compared to the period before the Covid-19 pandemic.

Based on Figure 4, 22 percent of commuter workers stated that large-scale social restrictions imposed by local governments were the main reason for temporal commuter workers not working. Also, there are 12 percent of the commuter workers who stated that the reason for the temporal absence of commuter workers is the decline in economic activity. This could happen due to restrictions on activities in the workplace and the center of the economy.
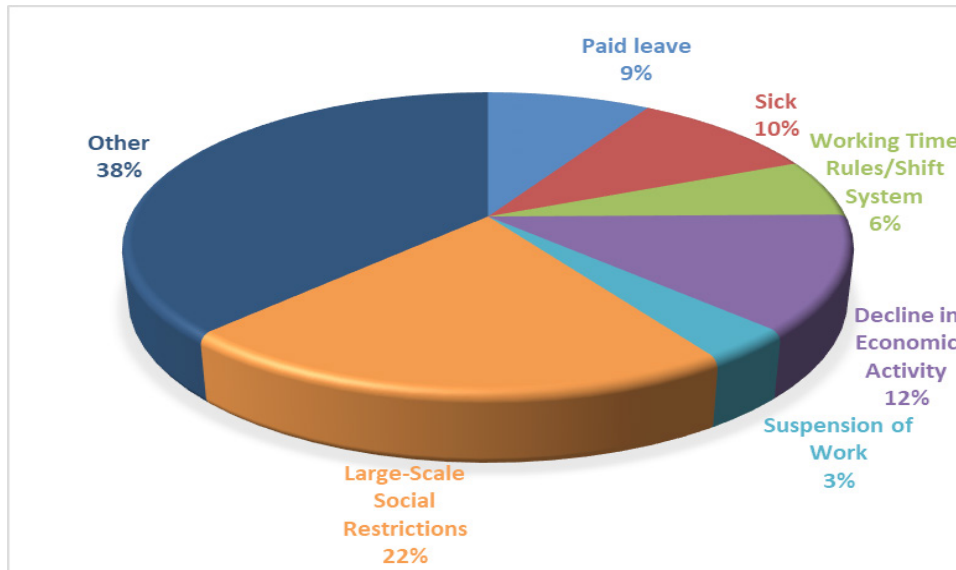
Source: Sakernas 2020, processed data

Figure 4. Main Reasons for Temporal Commuter Workers not Working in South Sulawesi Province

Commuter Worker Income during the Covid-19 Pandemic in South Sulawesi

To find out the variables that affect the income of commuter workers, the researchers used regression analysis. Before looking at the significant variables, the significance of all independent variables was tested together. It aims to determine whether all the independent variables can form a model. The results of the model significance test by including all independent variables into the regression model indicate that the resulting model is significant. This means that all independent variables, namely gender, education level, working hours, work from home, main job status and business field, can simultaneously explain the income variable. The test results in Table 1 show the significance of the model, meaning that the independent variables are jointly significant in forming the model with a confidence level of 95 percent. Therefore, the income of commuter workers is influenced jointly by all the independent variables used in this study.

Table 1. ANOVA Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18215.001	6	3035.833	5969.506	.000
Residual	64732.171	127286	0.509		
Total	82947.172	127292			

Source: Sakernas 2020, processed data

Based on the results of the simultaneous test which shows that all the independent variables used affect the income of commuter workers, the researcher also finds that the regression model that is formed based on all variables shows that all independent variables are partially statistically significant in influencing the income of commuter workers. Based on Table 2, the significance value of each variable is less than 0.5, so that it has a significant effect. It also shows there are two variables from the six variables whose coefficient values are negative (i.e., the main job status variable and gender), meaning that the greater the category code of the two variables, the smaller the income received by commuter workers.

The coefficient for the gender variable in Table 2 (i.e., -0.191) shows that female commuter workers tend to have lower incomes than male workers. The result is in line with the results of research by Iwata and Tamada (2014) which states that female commuter workers tend to receive lower incomes and shorter distances. It based this on the role of women, which are generally second breadwinners and the dual roles that are carried out, resulting in many women choosing to work in workplaces that are near to home even with lower incomes.

The education level variable shows a value of 0.238, which is positive, meaning that there is a positive relationship between the income received by commuter workers and the level of education. The higher the level of education completed by commuter workers, the greater the income received. Research conducted by Lee and Mcdonald (2003) in South Korea also shows that the level of education also influenced the travel time of shuttle mobility as a proxy for the level of wages. Commuter workers who completed diploma-equivalent education receive higher incomes than commuter workers with junior high school education levels and below.

Table 2. The Significance Test Results of All Independent Variables on the Income of Commuter Workers in South Sulawesi

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	14.355	0.009		1515.792	0.000
Gender	-0.191	0.005	-0.097	-37.788	0.000
Education Level	0.238	0.003	0.228	80.258	0.000
Working Hour	0.257	0.005	0.134	52.654	0.000
Work From Home	0.640	0.008	0.200	75.659	0.000
Main Employment Status	-0.670	0.008	-0.232	-88.424	0.000
Business Field	0.027	0.004	0.019	6.811	0.000

Source: Sakernas 2020, processed data

The variable working hours has a positive value of 0.257, which means the greater the working hours of commuter workers, the greater the income received. Commuter workers who work at least 35 hours a week will receive a higher income when compared to commuter workers who work less than 35 hours a week. Research conducted by Gutiérrez-i-Puigarnau and van Ommeren (2010) in Germany and Sultana and Weber (2014) in the United States also shows the same result that the number of hours worked affects not only the income of commuter workers but also the time they travel for shuttle mobility.

The next variable that affects the income of commuter workers is the main employment status. The value of primary job variable is negative (i.e., -0.670), meaning that commuter workers who work in the formal sector will receive higher incomes compared to the informal workers. This is in line with the study conducted by Kedir and Mckay (2005), showing that workers in the informal sector receive lower incomes than workers in the formal sector. This result is also in line with the study conducted by Gordon, Kumar, and Richardson (1989) which examines commuter workers who stated that commuter workers who work in the informal sector have more flexible hours but receive lower income than commuters who work in the formal sector.

The variable of implementing the work from home (WFH) policy in the office shows a positive value (i.e., 0.640), meaning that the workplaces where the WFH have been implemented, the income of received by the workers is also greater. A similar study conducted by Gottlieb et al. (2020) and Adams-Prassl et al. (2020) also indicates the same thing that workers who can work from home have higher incomes when compared to workers who cannot work from home. Although it cannot be denied that implementing the work from home policy also depends on the sector or business field that does not require too much manufacturing equipment and does not need to meet many people.

The business field variable has a positive coefficient, showing that the income of workers will be greater if they work in the service sector. Based on the results of the study conducted by Adams-Prassl et al. (2020), similar results in Germany, and contrast results in the UK and the United States, workers working in the service sector had reduced income and even lost their jobs.

Conclusion

The Covid-19 pandemic has had several impacts on several sectors, including employment. The magnitude of the unemployment rate does not only measure the impacts of Covid-19 on employment rate, but also the impacts that lead to the reduce in working hours and temporaral working. Implementing the PSBB and the regional quarantine has forced several companies to lie off their workers due to the decline in economic activities. This study aims to determine the impacts of the Covid-19 pandemic, specifically on working hours and income of commuter workers. Based on the analysis results, it indicates that there is a shift in work activities from the workplace to the place of residence. The restriction to activities reduces the number of working hours of commuter workers compared to the number of working hours when the Covid-19 had not yet become the endemic in Indonesia. Beside the reduction in working hours, restrictions on activities in the workplaces has even resulted in commuter workers having to temporarily not work. The reduction in commuting working hours also has had several impacts on the reduced income received by the commuter workers in South Sulawesi.

Based on the results of the August 2020 Sakernas data processing, it can also be concluded that the income of commuter

workers will be greater if the commuter workers are male, work in the service sector, have formal employment status, accomplish the level of education in diploma/university, have and high working hours. For this reason, of the implementation of WFH policy does not reduce commuter workers' income.

Direct support is highly needed for the most affected sectors and population groups, especially for companies and workers operating in the sectors, in this case is the informal sector. Specific measures include implementing WFH policy to support commuter workers affected by social restrictions. This needs to be complemented by some effort to ensure an adequate supply for food and other basic needs. The limitation of this study relies on the coverage area, which only covers the area of South Sulawesi. Finally, the author expected that further research can cover the entire territory of Indonesia.

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