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Does Working From Home Affects Income? Microdata Analysis Using Sakernas 2020

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Abstract:

One of the measures taken by the government to stop the COVID-19 virus from spreading was to restrict community activities during the pandemic. The strategy is a shock to business movement and the work market. A pandemic has made financial specialists adjust to more readily dominant computerized innovation at work. They must be prepared to work from home. As a result, the primary objective of this research is to comprehend how employees' incomes are affected by working from home. The multinomial logit estimation technique was utilized in this investigation. The 2020 Indonesian National Labor Force Survey is the source of the statistics (SAKERNAS). Cross-sectional data on a number of factors, such as the economy, education, and a small set of demographics, are available in SAKERNAS. The findings indicate that businesses that allow employees to work from home typically experience a decline in income. More specifically, workers have yet to be able to maintain their household income levels thanks to the implementation of digitalization. According to this study, the increase in worker resilience during the pandemic was also influenced by socio-demographic factors: age, training experience, urban living, and educational attainment. The income loss brought on by the work-from-home strategy is closely related to the commercial sector. Several business sectors have different outcomes when work-from-home rules are implemented. The difference in impact is likely caused by a readiness to implement technology. With the goal that later on, it is important to increment computerized understanding and capability, particularly for areas encountering a decrease in pay.

Keywords: *Income, Sakernas, Multinominal logit, Working from home*

1. Introduction

The government implemented a widespread social restriction policy once the pandemic extended globally and presented a high danger of transmission, even instituting a lockdown in some places (Diffenbaugh et al., 2020). As a result, many government and private offices have implemented the new working scheme, other businesses and workplaces are turning to work from home (WFH) arrangements (Jain et al., 2022). Nowadays, a growing number of workers opt to live in their houses, and working from home is regarded as a modern management technique. In this context, WFH has proven to offer high flexibility for workers (Kong et al., 2022). Furthermore,

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workers and the workforce have experienced a paradigm shift as a result of this new work culture. Prior study on WFH rules raised concerns regarding work-life balance, profitability, and productivity (Bloom et al., 2015).

Numerous workers have stated that they prefer WFH and will prefer remote work more after the COVID pandemic than they did before it. According to Baudot and Kelly (2020), it results from their evaluations of productivity increases. In any case, specific individuals might keep telecommuting, while others cannot afford it or are reluctant. According to studies (Figueroa et al., 2020), differences in the type of work affected by educational attainment may be related to the fact that people with higher levels of education are more likely to contract WFH during the pandemic.

This research generally focuses on how the WFH policy on worker income changes is implemented. It is believed that the pandemic-induced shift in work patterns altered productivity, affecting income. Based on these findings, this study aims to ascertain the impact that allowing employees to work remotely will have on their capacity to support themselves financially during the pandemic. The introduction of working from home may affect income. It could have a beneficial or detrimental effect. However, it is thought that the level of education, skills, and sociodemographic characteristics influence this effect.

The utilization of microdata to comprehend digital adaptation's effect on the economy has received little attention. As a result, the microdata of workers during the COVID-19 pandemic is used in this study to understand how work-from-home policies affected income patterns. By taking advantage of the abundance of data, we are able to investigate a number of the mechanisms and confounding factors that explain the connection between WFH and outcomes. Multinominal logit has been used as the evaluation method in this investigation. The 2020 Indonesian National Labor Force Survey is the source of the statistics (SAKERNAS). Many indicators are cross-sectional data in SAKERNAS, including the economy, education, and limited demographics.x`x`.

Based on the applied method, we describe how the links between WFH and outcomes differ across demographic groups, namely gender and marital status. The present literature frequently falls short of exploring this heterogeneity further. The effect of WFH will, however, probably vary depending on the opportunity costs of working and wage effect. The findings indicate that businesses that allow employees to work from home typically experience a decline in income. More specifically, workers have yet to be able to maintain their household income levels thanks to the implementation of digitalization. The increase in worker resilience during the pandemic was also influenced by many socio-demographic factors, according to this study: age, training experience, urban living, and educational attainment. The following is how the paper is set up: The following section offers a brief summary of the pertinent literature. The research method is then described followed by results. The paper concludes with a discussion and an outline of key findings and limitation for research and suggestion in this field.

2. Theoretical Background

Covid, socioeconomic disruption, and work from home

The COVID-19 pandemic has had an impact on economic activity. Agencies have implemented mobility restriction policies to prevent the spread of the virus. It certainly has an impact on the aspects of employment and transportation. In the end, the income change is the pandemic's final effect. Figure 1 shows the pattern of the relationship between covid 19 and income.

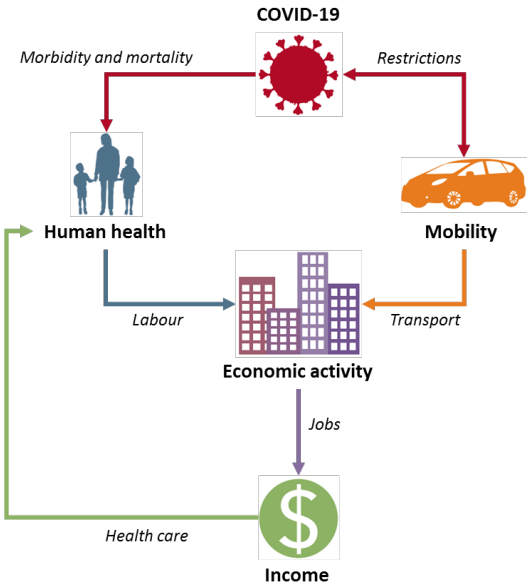

Figure 1. Covid-19 and socioeconomic disruption Note: Adapted from Diffenbaugh et al (2020)

Due to the COVID virus' global proliferation, office work has been forced to cease, and more people are working from home (Jain et al., 2022). WFH has spread much farther as a result of the COVID-19 pandemic's requirement for social isolation (Brynjolfsson et al., 2020). According to more data from the US, the percentage of people who work from home every day rose from 8% in February 2020 to 35% in May 2020 (a 400% rise). Compared to its European peers, Japan saw a far smaller increase in WFH (6% in January 2020, 10% in March 2020, 67% growth, and 17% in June 2020, 283% growth).

Work from home and wage effect

In the case of WFH, perceptions of advantages and disadvantages play a significant role in determining the advantages and disadvantages. Jain et al. (2022). According to them, the benefits of WFH include flexibility, avoiding traffic and travel, lowering travel expenses, conserving time, and facilitating family interactions. Additionally, WFH can improve the capacity to care for families, reduce stress, and boost productivity. On the other hand, the drawbacks of WFH include difficulties in achieving work-life balance, isolation, a lack of socialization, a lack of visibility at

work, and conflicts with personal life. The hypothetical impacts of WFH on compensation are equivocal. Generally speaking, WFH game plans may hypothetically lead to a compensation premium and a pay punishment. Its impact depends on the job and the individual. Depending on the relative strength of a hedonic effect, a signalling effect, and a productivity effect, they could result in a wage premium or penalty (Arntz et al., 2022).

First, the hedonic wage effect reflects a worker's willingness to pay or need to be compensated for working from home. Workers who gain utility from WFH by balancing their schedules or reducing the time spent commuting may trade WFH for leisure and wages. Workers who use WfH in response to the employer's needs but prefer on-site work may require higher wages as compensation. As a result, the hedonic effect might work in either direction. Second, WfH may alter how workers indicate their productivity or job attachment. Thirdly, if WfH motivates employees or creates a more productive work environment, it may increase productivity. On the other hand, employees may shirk, which is costly to monitor at home because they may be interrupted by family members or other personal responsibilities

3. Methodology

This study employs a quantitative methodology using secondary data. The 2020 Indonesian National Labor Force Survey (SAKERNAS), which was released by the Indonesia Statistic Bureau, provided the information (BPS). SAKERNAS provides cross-sectional information on a number of metrics, including the economy, education, and a few demographics. Our article's research focus is on employees above the age of 15. The method analysis adopted in this study is multinomial logit. The multinomial logit model is a logit model with more than two alternative choices. The output of this model is the prediction of the probability of the respondent's choice. The multinomial logit model can predict the likelihood of the impact of implementing working-from-home on income (increasing, decreasing, or not having an effect). The effect of WFH on income during the pandemic and the factors that influence income can be written as follows:

$$WorkingStatus_{it} = \alpha_0 + \alpha_1 WFH + \psi X_i + \varepsilon_i$$

Equation (1) will help answer how the WFH policy implemented by the company has an impact on workers' income. The dependent variable in this study is a categorical variable in the form of income change status, which is divided into three groups, namely; (i) Workers experience an increase in income, (ii) Workers experience a decrease in income, and (iii) Workers do not experience changes in income. On the other hand, the leading independent variable in this study is whether the individual works for a company that implements a WFH policy. The coefficient vector (ψ) on the variable, X, acts as a control variable that includes individuals' social demographic characteristics, including gender, place of residence, marital status, and education level. This study estimates different effects based on several socio-demographic characteristics of workers due to further insight into the relationship between WFH

adoption and labor income. So equation (1) will be estimated by considering the interaction effect between the WFH variable and the social demographic character of workers. Specifically, Table 1 shows the operational definition of variable in this research.

Table 1. Operational Definition of Variable

Variable	Status	Operational Definition
Income Worker (Y)	Dependent var.	Increase in income = 1, decrease in income = 2, income does not changed = 0.
WFH	Independent var. (key variable)	Working in a company that implements WFH = 1 Others = 0
Youth	Control var. (represent socio demographic aspects)	Dummy variable for young workers: workers aged 18-24= 1, others = 0
Urban		Dummy variable for region : urban = 1, others = 0
Man		Dummy variable for gender: male = 1, others = 0
Married		Dummy variable for marital status: married = 1, others = 0
Training	Control var. (represent education and skills aspects)	Dummy variable for training participation: completed = 1, others = 0
College		Dummy variable for college graduate, yes =1, others = 0
Senior High School		Dummy variable for senior high school graduate, yes =1, others = 0
Vocational High School		Dummy variable for vocational high school graduate, yes =1, others = 0

Furthermore, table 2 contains summary statistics for the main variables across income status categories.

Table 2. Summary Statistics By Income Status

	Increase in Revenue		Decrease in Revenue		Revenue has not changed	
Variable	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
WFH	0.0840	0.2774	0.0584	0.2346	0.1304	0.3367
Youth	0.1209	0.3261	0.0909	0.2875	0.1173	0.3218
Urban	0.3527	0.4778	0.5143	0.4998	0.4787	0.4995
Man	0.6763	0.4679	0.6769	0.4677	0.6142	0.4868
Married	0.7356	0.4410	0.7484	0.4339	0.7229	0.4476
Training	0.1949	0.3961	0.1190	0.3238	0.2375	0.4255
College	0.1528	0.3599	0.0841	0.2776	0.2467	0.4311
Senior High School	0.1995	0.3997	0.1998	0.3999	0.2097	0.4071
Vocational High School	0.0958	0.2944	0.1069	0.3090	0.1040	0.3052
Observation	9,873		125,416		161,926	

4. Empirical Findings/Result

The influence of the work-from-home policy on employees' pay during the pandemic is shown by the multinominal logit regression results in Table 3. The pseudo-r square has a value of 0.1083. It means that just 10% of the dependent variable can be explained by the independent factors. While other factors not included in this analysis account for 90% of the remaining explanation. For notes, three stars for values that

have an error rate of less than 1 percent and two stars for matters that have an error rate between 1 and 5. At the same time, 1 star indicates values with an error rate between 5 and 10.

Table 3. Multinominal Regression Result (Marginal Effect)

	Increase in Revenue	Decrease in Revenue	Revenue has not changed
WFH	**0.00977*** **	**0.07928*** **	**-0.08906*** **
Youth	0.00675***	-0.07275***	0.06599***
Urban	-0.01843***	0.07685***	-0.05841***
Man	0.00413***	0.03151***	-0.03565***
Married	0.00079	0.01728***	-0.01807***
Training	0.00899***	-0.06033***	0.05134***
College	-0.00181	-0.27461***	0.27642***
Senior High School (SMA)	-0.00280***	-0.07004***	0.07284***
Vocational High School (SMK)	-0.00439***	-0.05046***	0.05485***
Interaction Variable			
WFHxYouth	-0.00490	0.09713***	-0.09224***
WFHxUrban	0.00048	0.04539***	-0.04587***
WFHxMan	-0.00246	-0.02136***	0.02382***
WFHxTraining	0.00012	-0.03546***	0.03534***
WFHxMarried	-0.00044	-0.05449***	0.05493***
WFHxCollege	-0.01093***	-0.08785***	0.09878***
WFHxSMA	-0.00982***	-0.15258***	0.16240***
WFHxSMK	-0.00584	-0.13798***	0.14382***
Pseudo R2	0.1083		
N	793202		

*Notes: *** significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level*

The outcome reveals that the implementation of WFH has not been able to help workers survive during the pandemic. Employees of companies implementing work-from-home regulations have a greater chance of experiencing a decrease in income (marginal effect of 0.079). On the other hand, the opportunity to increase income for workers who implement work from home is only 0.009. This result is consistent with a number of earlier research, which found that WFH tends to harm workers' income (Dutcher, 2012; Glass & Noonan, 2016; Arntz et al., 2019). WFH can have a negative impact on income because home-based workers tend to be less productive. The lower disutility of WFH can also cause reduced wages due to the concurrent mixing of work activities with home activities. Furthermore, Wang et al. (2021) outlined that the non-optimal implementation of WFH is related to the inability to maintain or increase worker involvement and productivity, ineffective communication, and an unsupportive work environment.

On the other hand, although low, WFH also has the potential to increase workers' income. This increase occurs because WFH can increase workers' willingness to extend their working hours outside regular office hours. Higher hours worked in this context can then translate into higher wages. An extensive association between high income levels and high-speed Internet was discovered by a recent US study. WFH will be more profitable for workers with adequate technological facilities (Chiou & Tucker, 2020). In addition, several socio-demographic characteristics also worsen employee toughness amid the epidemic. Those are youth status, living in urban areas, gender, and marital status. Conversely, training participation gives workers more opportunities to increase income during the pandemic. However, higher education level makes workers resilient during the pandemic. Finally, both social demographic and skills interact with working-from-home make income changes. The findings reveal that working-from-home applicants who are young and from metropolitan regions have the worst effects during the pandemic.

This study estimates different effects based on several socio-demographic characteristics of workers to dig deeper into the relationship between WFH adoption and labor income. The resulting interaction results indicate that the impact of WFH varies between workers. Table 3 shows that gender, age of residence, education to marital status can differentiate the impacts of WFH on workers' income. However, in general, the impact of WFH still tends to be negative on income. The following discussion explains several socio-demographic variables that affect the income status of workers during the pandemic. First, the results in table 3 find that young workers (between 18-24 years old) are significant. It is more likely to experience reduced income than the base category (age group > 25 years). Young workers can potentially lose income with a marginal effect of 0.079. The younger age group may have less experience and perform semi-permanent jobs as a result. ILO (2020) and Verick (2009) stated that younger age could be hit harder during the economic shocks of the pandemic. Also, the ILO (2020) discovered that young people on the job market have been adversely impacted by the epidemic, particularly those in developing nations with open labor markets.

Second, the pandemic has a different impact when viewed by gender. Male workers tend to experience a decrease in income (marginal effect of 0.003) compared to female workers. In this regard, Nivakoski & Mascherini (2021) explain that male workers usually suffer losses in the labor market. They tend to have jobs in the manufacturing and construction sectors, which suffer the most during economic downturns. While in the other hand, women have historically increased their labor force involvement in times of economic crisis; this is regarded as a type of insurance in the family (Alon et al., 2020). Third, workers who live in cities tend to be more affected by the pandemic than workers who live in villages. The probability of workers in the city losing their income is more remarkable than that in urban, with a marginal effect of 0.07. These results align with Brooks et al. (2021). They found that Urban workers were typically more severely affected by pandemics than were rural workers. It happens because of the work's flexibility and workers' response to different policies between cities and villages. Due to the policy of limiting activities to prevent the spread of the virus, urban workers have the potential to lose working hours which causes their income to

decrease. On the other hand, the strategy is less likely to have an impact on rural employees. So they are less likely to leave their jobs so that they can relatively maintain their income.

Fourth, married workers tend to be more vulnerable to pandemic conditions. The findings indicate that married workers are more likely to see their income fall during the epidemic (marginal effect of 0.017). In a married household, the working couple decides how much time to devote to work, household chores, and child care due to the closure of schools to daycare facilities in response to the pandemic. As a result, in married families, there is an additional responsibility to take care of children at home so that working hours and income will be relatively reduced (Kalenkoski & Pabilonia, 2022). However, education plays a vital role in increasing community resilience during the pandemic. Statistical results show that graduates of higher levels of education have better job prospects, the lower their chances of losing income during the pandemic. Workers who completed their last education in Higher Education had a higher chance of maintaining their income during a pandemic with a marginal effect of 0.276. As for high school and vocational graduates, their chances of maintaining income during the pandemic are only 0.07 and 0.05, respectively. This result is consistent with research from the US Agency for International Development (USAID) (2018). They explain that educational attainment strengthens household resilience in various countries such as Ethiopia, Bangladesh, Burkina Faso, and Nigeria.

There are four reasons explain the critical role of education in efforts to increase worker resilience during a pandemic (Reyes, 2013; Varela et al., 2013; World Bank, 2018; Shah et al., 2016). First, education strengthens social capital. It serves as an essential safety net during crises. Second, education can increase individual capacity and quality, which is an essential foundation in the context of resilience. Third, education plays a vital role in increasing people's knowledge. Lastly, education strengthens aspirations, confidence, and the ability to recover after a crisis. In line with formal education, non-formal education, which in this case is training, does not escape being a vital provision for individuals during a pandemic. Workers who have attended the training have a higher probability of maintaining their income (marginal effect of 0.05) and increasing their income (marginal effect of 0.008). Participation in training certainly provides more skills so that they are more able to survive during the pandemic crisis.

5. Conclusions

This study shows that the implementation of WFH was unable to assist workers in maintaining their financial situation. The results of this study indicate that employees who work for organizations with work-from-home policies typically see a drop in pay. This study finds that improving skills, such as participation in training, can increase the chances of workers to enhance their income during the pandemic. Youth and urban dwellers who apply WFH experience a more severe impact on income. On the other hand, someone who has done training and implemented WFH has an impact that can still be suppressed on his income. Understanding how the implementation of Work

From Home policies in the labor market affects wages is very relevant. Policymakers should be responsible for designing legal frameworks to support or improve these WFH policies. The implications of this study emphasize the need for relevant policies to address the inequalities that will arise in the labor market as a consequence of implementing WFH policies.

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