

The Effect of Internet Use on the Probability Work In Indonesia

M. Arizal

(Graduate of Economics, Faculty of Economics and Business/ Universitas Indonesia, Indonesia)

ABSTRACT: This study aims to see how the effect of internet use on probability work. The internet use variables are proxied by the use of the internet to search for information, send and receive e-mail, as well as internet access for social media. The data used comes from the March 2020 National Socioeconomic Survey (SUSENAS). The method used is logistic regression with a sample size of 801,683 individuals. The results of this study indicate that using the internet to find information increases the chances of working by 4.28%, using the internet to send and receive emails increases the probability of working by 7.34%, and using the internet for social media increases the probability of working by 1.59%. Based on the results of this study it can be concluded that the use of the internet associated with receiving information increases the chances of working for individuals in Indonesia.

KEYWORDS: Internet, Work, Logistic, Unemployment, Signaling

I. INTRODUCTION

The presence of information technology in the form of broadband internet can reduce the costs of disseminating and searching for information (Gürtzgen et al., 2021). The efficiency resulting from the presence of the internet makes market performance better (Brynjolfsson & Smith, 2000; Carr, 2003; Tang et al., 2018). In the context of the labor market, the presence of the internet can bring job seekers together with job vacancies providers, thereby encouraging a matching process (Autor, 2001). This matching process is reflected in the increasing job search and job recruitment that is being done online (Devaro & Gürtler, 2017). Therefore, the development of information technology, especially the internet, must receive greater attention so that it can benefit the workforce.

Furthermore, one of the benefits of the presence of the internet for the workforce is shortening the duration of unemployment (Beard et al., 2012). In other words, it can increase the chances of working for job seekers. With the internet, problems such as information asymmetry in the form of information related to the location of job vacancies and the wages that they will receive can be overcome (Mortensen, 1986). Romer (2001) also supports this explanation that the cause of unemployment is often associated with a mismatch of information between job seekers and vacancies so that there is no efficiency in the use of resources. This means that there are limitations or frictions related to information. However, with the rapid development of information technology and global communication, a lot of information should be available on the internet (Gürtzgen et al., 2021). The increase in active mobile broadband users illustrates the expansion of internet use.

The expansion of the internet when viewed from the Indonesian context in the last five years 2016-2020 has shown quite significant progress (BPS, 2020a). Internet users at the household level show the most rapid development of other information and communication technology index indicators. The growth of internet users at the household level reached 78.18% in 2020. Other indicators of information and communication technology also grew rapidly, such as cell phone use in households reaching 62.84% and computer use growing by 18.83% in 2020. This implies progress on the development of the internet which might have an effect on the economic sector through absorption of labor so that unemployment can be reduced.

However, even though the internet developed quite rapidly in 2020, macroeconomic indicators did not show encouraging results. One of them is the unemployment indicator. There was an increase in the number of unemployed people in 2020 when compared to 2019. Overall in 2020 there were 138.22 million people in the workforce and 9.77 million people who were unemployed, even though in 2019 there were only 7.05 million unemployed (BPS, 2020). With the anomaly from the data above where information and communication technology indicators increase but the unemployment rate also increases, it is important to conduct this study in Indonesia to see the effect between the two so that what policy is right to be formulated can be formulated.

Empirical studies related to the effect of internet use on unemployment or the probability of working are still inconclusive because there are differences in research results. Gürtzgen et al., (2021) conducted a study in Germany and found that broadband internet can increase male re-employment and overall increase online job search. Likewise, the study conducted by Lobo et al., (2020) and Atasoy (2013) also found the same result that broadband internet increases the rate of re-employment or reduces the duration of unemployment. The results of a different study were found by Kroft & Pope (2014) who found that Internet job search had no effect on unemployment and only reduced the number of advertisements available in traditional print media. In contrast to previous studies, research conducted by Kuhn & Skuterud (2004) estimated using OLS, found that the internet has a negative impact on length of unemployment, which means that job searches via the internet lead to longer periods of unemployment. This empirical study seems ambiguous because there are different study results.

In the Indonesian context, so far there has been no research that has focused on examining the relationship between information communication technology or the internet, which is proxied in detail by using the variables of internet use to search for information, receive and send e-mail, and social media on the probability of working length of time, where there may be a correlation between the variables. this. The question is whether the use of the internet can increase the opportunity or chances of getting a job in Indonesia. The conjecture is that using the Internet will increase job opportunities for those who use it. This conjecture is based on job search theory. There are several main contributions from this study. First, this study examines in detail the effects of various internet uses on employment opportunities. Second, this study uses the most recent data with a large sample size.

In this study, the estimation results show that for the variable seeking information, individuals who use the internet have a higher probability of working by 4.28% compared to individuals who do not use the internet to search for information. A unidirectional relationship is also shown by the internet usage variable for email, namely individuals who use the internet to send and receive emails have a higher probability of working at 7.34% compared to individuals who do not use the internet to send and receive emails. Then for the variable use of the internet for social media it shows that individuals who use the internet for social media have a higher probability of working at 1.59% compared to individuals who do not have access to using the internet for social media. In general, internet usage variables related to receiving and sending information show positive results on the probability of working

II. RESEARCH METHOD

This study uses secondary data sourced from the Central Bureau of Statistics (BPS). The data used is Susenas data for March 2020. The unit of analysis consists of 801,683 individuals. The March 2020 Susenas data includes sample survey data for all households in Indonesia. To answer the research questions from this study, Susenas data used Basic Information on Household Members (KOR). Data on working status can be found in the Block 7 questionnaire on Employment number 702. Internet ownership and usage data can be found in the Block 8 questionnaire on information and communication technology. Internet ownership data is contained in questionnaire number 808. Data on internet usage for various purposes is contained in questionnaire number 811. The following describes all the data and variables used in this study, which can be seen in Table 2.1 below.

Table 2.1 Variable Description

Variable	Description	Category
Work Status	1=Work, 0=No	Dummy

Variable	Description	Category
Internet Ownership	1=Yes, 0=No	Dummy
Internet Use		
Information Searching	1=Yes, 0=No	Dummy
Email	1=Yes, 0=No	Dummy
Social Media	1=Yes, 0=No	Dummy
Married	1=Yes, 0=No	Dummy
Male	1= Male, 0=Female	Dummy
Urban	1= Urban, 0=Rural	Dummy
Education		
No Elementary	1=Yes, 0=No	Dummy
Elementary School	1=Yes, 0=No	Dummy
Junior High School	1=Yes, 0=No	Dummy
Senior High School	1=Yes, 0=No	Dummy
Diploma/Bachelor	1=Yes, 0=No	Dummy
Postgraduate	1=Yes, 0=No	Dummy
Age	Age of Individual in HH	Numerical

This study aims to see how the effect of internet use on probability works. The internet use variable is proxied by the use of the internet to search for information, send and receive e-mail, as well as internet access for social media. Meanwhile, the dependent variable is whether to work or not to work in 2014. This study uses logistic regression and adopts the model from Choi (2022) as follows:

$$Y_i = \alpha + \beta Info_i + \gamma Email_i + \varphi SocMed_i + \Omega Control Variable_i + \varepsilon_i$$

Where Y_i is the dummy outcome variable working (1) and not working (0), $\beta Info_i$ is the main independent variable in the form of using the internet to search for information, $\gamma Email_i$ is the main independent variable in the form of using the internet to send and receiving email, $\varphi SocMed_i$ is the main independent variable in the form of internet use for social media, $\Omega Control Variable_i$ is the control variable consisting of variables of marital status, location of residence, gender, education level and age, and ε_i is the error term.

III.RESULT

This study uses March 2020 Susenas data to see how the effect of internet use as a proxy for using the internet to search for information, receive and send e-mail, and use of social media has on the probability of working or not working for individuals with a total sample of 801,683 individuals aged 15-64 years. In Table 3.1 below we can see how the distribution of the data is used to see the relationship between these variables.

Table 3.1 Statistic Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
Work Status	801683	.649	.477	0	1
Information Searching	801683	.414	.493	0	1
Email	801683	.071	.256	0	1
Social Media	801683	.512	.5	0	1
Internet	801683	.55	.497	0	1

Married	801683	.671	.47	0	1
Male	801683	.501	.5	0	1
Urban	801683	.43	.495	0	1
Education
No Elementary	801683	.112	.316	0	1
Elementary School	801683	.257	.437	0	1
Junior High School	801683	.229	.42	0	1
Senior High School	801683	.297	.457	0	1
Diploma/Bachelor	801683	.099	.299	0	1
Postgraduate	801683	.005	.073	0	1
Age	801683	36.97	13.734	15	64

Source: Results of Susenas Data Processing by the Author

In Table 3.1 there are as many as 64.9% of individuals who work and the rest do not work, there are as many as 41.4% of individuals who use the internet to search for information, there are as many as 7.1% who use the internet to receive and send e-mails, and there are as many as 51.2% of individuals who use the internet for the purposes of accessing various social media platforms. Furthermore, in Table 3.2 it can be seen how the distribution of individuals accessing the internet is seen based on urban or rural locations.

Table 3.2 Internet Access Based on Urban/Rural

Location	Internet		
	No Internet	Internet	Total
Rural	254955	202358	457313
Urban	105794	238576	344370
Total	360749	440934	801683

Source: Results of Susenas Data Processing by the Author

In Table 3.2 above it can be seen how the distribution of internet access is based on location of residence. Of the 457,313 individuals who live in rural, 254,955 have not used the internet during the last 3 months or it can be said that more than 50% of individuals living in rural have not used the internet. For individuals who live in urban areas, when compared to individuals who live in rural areas, only 105,794 individuals do not yet use the internet and as many as 238,576 already have internet access. Based on the data above, it can be concluded that more than twice as many people living in rural areas do not have internet access when compared to those living in urban areas. Then to see how the distribution of data for those who have internet access on working or not working status can be seen in Table 3.3 below.

Table 3.3 Work Status and Internet Access

Work Status	Internet		
	No Internet	Internet	Total
No Work	115905	165867	281772
	41.13%	58.87%	100.00%
Work	244844	275067	519911
	47.09%	52.91%	100.00%
Total	360749	440934	801683
	45.00%	55.00%	100.00%

Source: Results of Susenas Data Processing by the Author

Based on Table 3.3 above, it can be seen that individuals who have internet access have a greater percentage of working. From a total of 801,683 samples, 519,911 are working and more than 52% have internet

access. This can be interpreted that those who have internet access have the opportunity to have working status with a greater percentage.

The aim of the study is to see how the effect of using the internet to search for information, receive and send e-mails, and for social media has on the probability of working or not working. To achieve this goal, this study performs inferential analysis using a logit model. The use of the logit model is done because the dependent variable is qualitative, namely the possibility of working or not working. The results of inferential analysis can be seen in Table 3.4 below. Table 3.4 also shows the regression results using OLS to see the consistency of the estimation results using the logit model. The estimation results using OLS and logit appear to be quite consistent with the same sign for all variables and there is only a small difference in the magnitude of the coefficients, which from these results the use of OLS appears to be slightly downward biased. To ensure the robustness estimation results, a robustness check test is carried out by means of multilevel regression. Multilevel regression is carried out by performing regression with and without control variables. The multilevel regression results which can be seen in the appendix show that the estimation results are quite robust.

In Table 3.4 of the logit model, the estimation results show that for the variable seeking information, individuals who use the internet have a higher probability of working by 4.28% compared to individuals who do not use the internet to search for information. A unidirectional relationship is also shown by the internet usage variable for email, namely individuals who use the internet to send and receive emails have a higher probability of working at 7.34% compared to individuals who do not use the internet to send and receive emails. Then for the variable use of the internet for social media it shows that individuals who use the internet for social media have a higher probability of working at 1.59% compared to individuals who do not have access to using the internet for social media. In general, internet usage variables related to receiving and sending information show positive results on the probability of working.

Table3.4 Regression Result

	OLS	Logit
	Work	Work
Information Searching (d)	0.0357*** (0.00141)	0.0428*** (0.00161)
Email (d)	0.0508*** (0.00187)	0.0734*** (0.00224)
Social Media (d)	0.0114*** (0.00142)	0.0159*** (0.00166)
Married (d)	0.143*** (0.00123)	0.173*** (0.00143)
Male (d)	0.319*** (0.000936)	0.366*** (0.00107)
Urban (d)	-0.0580*** (0.000999)	-0.0712*** (0.00123)
Age	0.00752*** (0.0000468)	0.00923*** (0.0000569)
No Elementary School	-0.0157*** (0.00170)	-0.0158*** (0.00210)
Junior High School	-0.0777*** (0.00184)	-0.0789*** (0.00233)
Senior High School	0.0310*** (0.00177)	0.0405*** (0.00212)

Diploma/Bachelor	0.146*** (0.00226)	0.168*** (0.00206)
Postgraduate	0.126*** (0.00577)	0.190*** (0.00623)
No. of Obs.	801683	801683
R-Squared/Pseoude R	0.231	0.200
F-stat/Chi2	26327.2	0.0000

Marginal effects; Standard errors in parentheses

(d) for discrete change of dummy variable from 0 to 1

* p<0.10, ** p<0.05, *** p<0.001

Source: Results of Susenas Data Processing by the Author

Variables related to individual characteristics in the estimation results 3.4 also show quite significant results. In the married variable, it can be seen that married individuals have a higher probability of working at 17.3% compared to individuals with unmarried status. For the gender variable, the estimation results show that the probability of a man working is 36.6% greater than that of a female individual. A different direction is indicated by the variable of residence, in which individuals who live in urban areas have a lower probability of working by 7.12% compared to individuals who live in rural areas. Then for the age variable it can be seen that when the age increases by one year, the probability of working increases by 0.9%. For educational variables, the variable that becomes the basis is those who have not finished elementary school or have not attended school. The estimation results show that for elementary and junior high school levels the probability of working is lower than for individuals who did not finish elementary school, while for senior high school to bachelor/graduate education variables it shows a positive relationship with the probability of working, which means that the higher the education, the higher the opportunity to work.

IV.DISCUSSION

The estimation results in this study indicate that the availability of internet access increases individual work opportunities. The results of this study are in line with studies conducted by Beard et al., (2012) & Czernich (2014) which also found a negative relationship between internet use and unemployment. In other words, these studies conclude that using the internet increases an individual's chances of getting a job. This study has an advantage over previous studies because it uses a more specific internet usage variable, namely what internet access is used for. Related to that, this study uses three types of internet use that support the receipt or sending of information that can encourage individuals to find a job. These variables are the use of the internet to find information, send or receive e-mail, and use of the internet for social media. This study found that the internet variable for searching for information and receiving or sending email has a higher probability of working, 4.2% and 7.3%, respectively, and the internet variable for social media also has a positive relationship but the coefficient is small, namely 1.59%. The findings from this study are quite in line with the reality of current developments, in which various job information is available on the internet so that people who have internet access have a higher probability of working. This is also in accordance with the job search theory in which technology in the form of the internet can reduce certain barriers such as the existence of imperfect information, high costs of looking for work, the job matching process so that individuals with the presence of internet technology will have higher job opportunities due to efficiency.

Another finding from the study is that individuals who are married have a higher probability of working than those who are not married. This may be caused by individuals who are married have dependents or economic burdens that require them to work. This study also found that the issue of gender inequality is caused by a much higher probability that men will be employed than women. Several studies have also found something similar, and explained that this happens because there is still discrimination in the workplace where companies tend to prefer male workers over women and women in developing countries often take care of the household after marriage. Then, individuals who live in urban areas have a lower probability of working compared to individuals who live in rural areas. According to Winarsih & Lisna (2015), this may be due to intense competition for jobs in urban areas, urbanization flows, and high levels of education or qualifications in

urban areas. The age variable in this study also shows a positive relationship with employment opportunities. This means that with an increase in food the accumulation of human resources is increasing so that the opportunity to work also increases. Finally, the education variable at the high school to university level shows a positive relationship with the probability of working. Based on Grossman and Becker's theory, an increase in the length of education means an increase in the quality of human resources. This is what causes their job opportunities to be higher

V. CONCLUSION

This study wants to see how internet access and use can affect the probability of working in Indonesia. The data used is the March 2020 Susenas, with a total sample of 801,683 individuals with an age range of 15-64 years. Using logistic regression, this study found a positive relationship between internet use and employment opportunities. Access to and use of the internet is proxied by individuals who use the internet to search for information, send and receive e-mail, as well as for social media. This finding corroborates previous studies that the presence of information and communication technology in the form of the internet provides efficiency, especially for job seekers. However, even though internet access has a positive effect on the probability of working, inequality of internet access in urban and rural areas still occurs.

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