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Does Internet Use Help Informal Entrepreneur Increase Their Income? Evidence from Manufacturing Sector in Indonesia

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Abstract. Manufacturing is a very important field of business in the informal sector. While other business fields experienced a decline in income during the pandemic, informal businesses in the industrial sector recorded an increase in average income during this period. Using National Sosioeconomic Survey (Susenas) 2021 data, this research aims to analyze the role of internet use in increasing the income of informal entrepreneurs in the industrial sector during the last pandemic. Based on the results of an analysis using the endogenous treatment effects model, (1) Informal entrepreneurs in the manufacturing sector who have higher assets, live in urban areas, younger ages, and higher level of education have greater opportunities to use the internet in their business; (2) Informal entrepreneurs in the manufacturing sector who are male have a greater tendency to use the internet for the purpose of seeking information and financial activities; (3) The use of the internet for information search, buying and selling transactions, and financial activities has a positive and significant impact on increasing income; (4) The use of the internet for financial activities has the greatest influence on the income of informal entrepreneurs in the manufacturing sector. Therefore, it is necessary to have policies from related parties to support increased use of the internet through equitable development of infrastructure and the provision of training related to effective and efficient use of the internet that can have a positive impact on business activities.

Keywords: *Informal Entrepreneur; Manufacturing Sector; Internet Use; Endogenous Treatment Effects*

1. INTRODUCTION

The informal sector is an important part of the Indonesian economy. One of its important roles can be seen during the COVID-19 pandemic that hit Indonesia in 2020. The decline in economic activity faced by the majority of Large Medium Enterprises caused layoffs to become widespread during the past pandemic. As a result, the unemployment rate increased very significantly from 4.94 percent before the pandemic to 7.07 percent during the pandemic, namely August 2020 (BPS, 2020a). The large number of formal sector workers who lost their jobs during this pandemic caused a surge in the number of informal sector workers, it was recorded that in 2020 as many as 60.47 percent of workers in Indonesia were workers in the informal sector, a significant increase from the previous 55.88 percent in 2019 (BPS, 2020b).

In the informal sector itself, in 2020 the majority were still dominated by workers who acted as informal entrepreneurs compared to those who only acted as workers. It was recorded that 59.53 percent of informal sector actors were informal entrepreneurs while the remaining 40.47 percent were informal workers. In Indonesia, informal sector firms are classified into three categories: agriculture, industry, and services. Unlike the agricultural and service sectors, which saw income declines, the informal entrepreneurs income in manufacturing industry increased throughout the epidemic. As shown in Figure 1, the average income of informal industrial sector entrepreneurs has increased from 1,652 million in 2019 to 1,822 million in 2020. This shows that the industrial sector is one of the informal sector business fields that is resilient enough to overcome the negative impacts of pandemic in Indonesia.

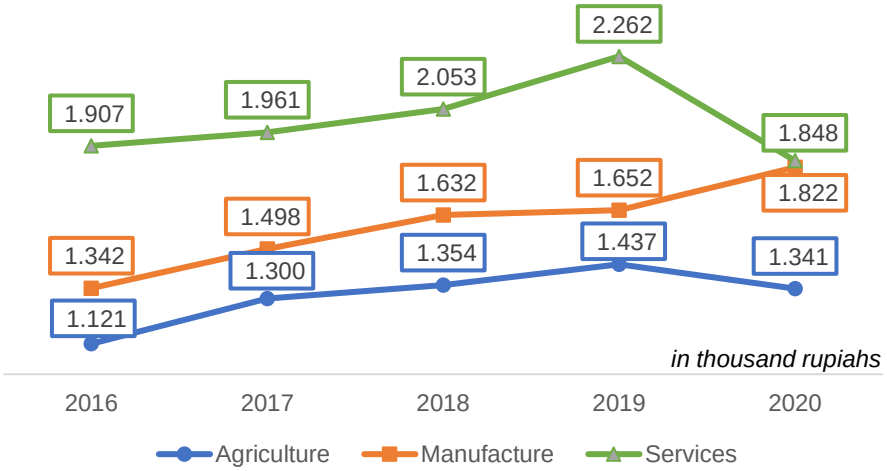

Figure 1. Informal Entrepreneur's Income by Industry in Indonesia, 2016-2020
Source: BPS, 2016-2020

On the other hand, the restrictions on mobilization that occurred during the past pandemic also had a positive impact on the development of the digital sector in Indonesia. The percentage of the population accessing the internet has increased significantly from 47.69 percent in 2019 to 53.73 percent in 2020 (BPS, 2021). Likewise, the volume of digital transactions has increased from 9.77 billion transactions in 2019 to 17.70 billion transactions in 2020 (Budiarto, 2020). The development of the digital sector has also contributed to an increase in the revenue of this informal entrepreneurs. According to Susenas 2021 statistics, informal entrepreneurs that use the digital technology have an average income of IDR 2.30 million, higher than those who do not use the internet with an average income of IDR 1.56 million.

From these empirical data, researchers feel the need to examine more deeply how the implementation of the use of the internet as a representation of the development of information technology, especially in the industrial sector informal entrepreneurs. Considering that the industrial sector is a sector that is tough enough to overcome the impact of the pandemic in Indonesia. It is hoped that this study will produce scientifically appropriate recommendations that can be applied to policies related to improving the welfare of people involved in informal businesses in Indonesia.

2. LITERATURE REVIEW

2.1 Internet Use Decisions

In the business world, decision making is one aspect that is very important and influences the continuity of a business unit. Decisions that are made often prioritize the maximum profit or maximum utility that is obtained after going through the process of analyzing the level of cost and benefit values that are likely to arise.

The concept of cost is one of the important factors in the decision making process. To make effective decisions, decision makers must consider the costs and benefits of using them. Costs can be interpreted as sacrifices of economic resources used to obtain goods or services that are expected to bring benefits both in the present and in the future (Mursyidi, 2008).

One cost concept that is closely related to choice or decision making is opportunity cost. Opportunity cost is defined as the benefit that is given up on decisions or other choices that are not chosen. In the decision-making process, a person will be faced with several alternative choices, each of which has different advantages or disadvantages, and then the one that is considered the most effective and efficient is chosen due to limited resources (Pindyck & Rubinfeld, 2018).

2.2 Internet Use and Increasing Income

This transaction cost theory is one of the economic theories that is frequently utilized when it comes to the usage of technological devices or internet access in company activities. (Wigand, 1997). The implementation of technological advances and the internet is able to encourage a shift in transactions into electronic systems that are able to have an impact on reducing transaction costs within a company. Companies tend to choose transactions that are able to save on coordination costs. Transaction costs will tend to be closer to zero as information and communication technology advances, allowing for more inventive forms of coordinated transactions that are in accordance with the new business system. One example of a company's efforts to reduce transaction costs is the rising and inventive use of the internet to conduct business.

According to Kotler et al., (2016), technology allows for automation and miniaturization, which can reduce production costs and increase the reach of companies to serve a wider range of new markets. With the existence of technology, various products and services that were once considered exclusive can now be enjoyed all over the world. Transparency that is presented through the internet makes entrepreneurs from developing countries to get inspiration from developed countries. In the online world, social media has redefined the way people interact with each other making it possible for them to build relationships across geographic and demographic barriers.

3. RESEARCH METHODS/METHODOLOGY

Secondary data from the National Socioeconomic Survey (Susenas) performed by Statistics Indonesia in March 2021 are used in this study. According to the study aims, the sample utilized is an informal entrepreneur in the manufacturing sector, i.e. someone having a self-employed job status, with a total of 17,392 observations.

Table 1 explains the variables employed in this study and their classifications.

Table 1. Endogenous, Exogenous, and Categories of Variables

	Variables		Category
Endogenous Variable	Internet uses for information searching	INTI	0 = Don't use* 1 = Use
	Internet uses for buy and sale transaction	INTB	0 = Don't use* 1 = Use
	Internet uses for financial transaction	INTF	0 = Don't use* 1 = Use
	Income	INC	Milion rupiah
Exogenous Variables	Assets owned	ASSET	Milion rupiah
	Residential area	URB	0 = Rural* 1 = Urban
	Gender	SEX	0 = Female* 1 = Male
	Age	AGE	Year
	Gender	SEX	0 = Female* 1 = Male
	Education level	EDU	Years of school

*Note. *Reference Category*

The endogenous treatment effects model with the equation model as follows was used to fulfill the study purpose of analyzing the factors of internet usage decisions and their influence on the revenue of informal entrepreneurs in the manufacturing sector.

$$INC_i = a_0 + a_1\, SEX_i + a_2\, AGE_i + a_3\, EDU_i + a_4\, INT_i + \varepsilon_1 \quad (1)$$

$$INT_i = b_0 + b_1\, ASSET_i + b_2\, URB_i + b_3\, AGE_i + b_4\, SEX_i + b_5\, EDU_i + \varepsilon_2 \quad (2)$$

dimana:
$a_0, \ldots, a_4$: The parameter coefficient of the income equation
$b_0, \ldots, b_5$: Parameter coefficient of the internet usage equation
$\varepsilon_1, \varepsilon_2$: *Error*

4. RESULTS AND DISCUSSION

According to observational data, internet use among informal bussinessman in the manufacturing sector remains low. In 2021, the proportion of informal industrial sector entrepreneurs who use the internet with the aim of finding new information is 36.13 percent. Meanwhile, the proportion of entrepreneurs using the internet for buying and selling transactions and financial transactions was 11.35 percent and 2.67 percent, respectively. Informal entrepreneurs in the manufacturing sector earn an average of IDR 2.01 million per month.

In general, men entrepreneurs who live in urban areas dominate the characteristics of informal entrepreneurs in Indonesia's manufacturing sector. In terms of education, however, informal entrepreneurs in the manufacturing industry continue to be dominated by individuals who have not completed junior high school, with an average duration of schooling of 7.80 years. This demonstrates that informal entrepreneurs from this industry still have a low degree of competence. Table 2 shows the details in full.

Table 2. Characteristics of Informal Entrepreneurs

Characteristics		**Value**
Average Income (milion Rp)		2.01
Average Value of Owned Assets (milion Rp)		191.14
Average Age (years)		46.39
Average School Years (years)		7.80
Region Classification	Rural	45.31%
	Urban	54.69%
Sex	Female	44.20%
	Male	55.80%
Internet use for Information Search	Do not Use	63.87%
	Use	36.13%
Internet use for Buying and Selling	Do not Use	88.65%
	Use	11.35%
Internet use for Financial Transaction	Do not Use	97.33%
	Use	2.67%

Source: National Socioeconomic Survey 2021 (processed)

Asset ownership, regional classification, age, gender, and education level have a significant influence on the decision to use the internet for informal entrepreneurs in the manufacturing sector in Indonesia. Informal entrepreneurs from manufacturing industries who own greater assets, reside in cities, are younger, and have a better education have greater possibilities to utilize the internet for information search, buying

and selling transactions, and financial transactions. Male informal entrepreneurs have a greater chance to utilize the internet for information and financial transactions, whereas female informal entrepreneurs have a greater chance to access the internet for buying and selling activities.

Table 3. Linear Regression with Endogenous Treatment Effects

Variables	Internet use for		
	Information Searching	**Buy and Sale Activities**	**Financial Transaction**
Endogen: Internet Use by Informal Entrepreneurs			
Asset	.001**	.001**	.003**
Urban	.543**	.581**	.657**
Age	-.039**	-.025**	-.006*
Male	.203**	-.198**	.133*
Education	.120**	.099**	.137**
Constant	-.332**	-1.576**	-4.222**
Endogen: Income of Informal Entrepreneurs (milion rupiahs)			
Male	.414**	.470**	.428**
Age	.004**	.000	.002**
Education	.051**	.062**	.063**
Internet	.621**	.854**	2.140**
Constant	.947**	1.123**	1.276**

Significant level at *0.05, **0.001

4.1 Determinants of Internet Use by Informal Entrepreneurs

Assets have a positive influence on internet usage decisions. This is because someone who uses the internet must incur costs in providing supporting infrastructure. When connected with the concept of cost, direct costs appear as direct costs that must be incurred by someone to provide equipment to support internet use, so that someone who is richer will have a greater opportunity to meet the direct cost of providing the internet so that they will also have a greater chance of using it. internet to support their business activities.

There are differences in the use of the internet between entrepreneurs who live in rural areas and urban areas. This is due to differences in supporting infrastructure and different internet access speeds between urban and rural areas. According to the assertion of Myovella et al. (2021) where higher internet usage by urban residents as a result of the provision of more complete infrastructure in urban areas. It is undeniable that the infrastructure provided by a region will be able to accelerate the information technology adaptation process of the residents of that region (Deja et al., 2021; Sánchez, 2017).

The next factor that influences informal entrepreneurs' usage of the internet is age. In contrast to the previous variables, the age variable has a negative influence on internet usage decisions. This means that the older the informal entrepreneur, the lower the tendency or opportunity to use the internet. Chaudhuri et al. (2005) stated that the use of the internet which requires the ability to use information technology devices results in someone who is younger being able to get better access to use it than people of the older generation. The millennial generation, which has grown up in an environment where the use of digital technology has become a common habit, will find it easier to adopt the use of the internet than people from the older generation who have to go through a new learning process at a no longer young age, which of course will be more difficult to do (Chaiklin, 2010; Prensky, 2001).

There's also a gender difference in internet usage among Indonesian informal

entrepreneurs. As is the case in most developing countries where the level of internet use for men is higher than for women (Acilar & Sæbø, 2023). Women tend to spend more time on household chores, so they have less time to access the internet (Wong et al., 2020). In addition, there are differences in patterns of internet use between men and women. Men use the internet to consume news, listen to radio, watch television, play games, and conduct debates, whereas women use it to buy entertainment tickets, shop, or talk. (Gargallo et al., 2010).

The degree of education has a favorable and substantial impact on informal entrepreneurs in Indonesia's manufacturing sector's decision to utilize the internet. According to a large body of evidence, the degree of education has a significant impact on the level of internet use. Someone with a lesser degree of education will have less access to information technology, fewer ICT skills, and will use ICT or the internet less frequently (van Deursen & van Dijk, 2015). Someone who has a lower level of ability tends to require more time and money in the process of adapting to internet use.

4.2 Determinants of Informal Entrepreneurs' Income

The following discussion is related to the variables that influence the earnings of Indonesian informal businesses in the manufacturing industry. When examined from the output formed, the gender variable shows a fairly large coefficient value. This suggests that there is still a gender difference in Indonesia, where male entrepreneurs' welfare levels are greater than women's in the informal sector. One of the things that underlies the existence of a gender gap is that there is a tendency for male entrepreneurs or workers to have a higher level of productivity than women, especially in informal sector businesses, where this gap can be reduced with a higher level of education (Satria, 2018).

The age variable has a positive and considerable effect on the earnings of informal entrepreneurs in the manufacturing sector. This indicates that the money earned by an informal entrepreneur in the manufacturing industry increases with age. This shows that in this business field tends to be influenced by innovation and better experience, which according to theory is owned by someone who is older, to be able to increase income from their business activities.

In the manufacturing business field, the variable level of education has a substantial impact on the earnings of informal entrepreneurs. With a positive coefficient in all models of internet use, it shows that the higher the level of education of informal entrepreneurs, as indicated by the longer the school year, the greater the income received. In accordance with the theory of human capital and findings from previous studies where a higher level of education will have a positive effect on increasing the competence of a person. So that with higher competence will have better productivity which can then increase the income generated.

The effect of using the internet to search for information on the income of informal entrepreneurs in the manufacturing sector shows a positive and significant coefficient. With a coefficient value of 0.621, it means that informal entrepreneurs who use the internet to search for information have a greater income than entrepreneurs who do not use it with a difference of 621 thousand rupiah. This shows that the use of the internet for information search provides positive benefits for the continuity of informal businesses in the manufacturing sector. The use of the internet is able to provide information for informal entrepreneurs regarding the latest production methods, market demand trends, commodity price trends, and other information that is useful for developing their business.

Likewise with the use of the internet for buying and selling activities in the manufacturing business field which has a significant influence with a coefficient value of 0.854. This means that internet-savvy informal businesses in the industrial sector for buying and selling activities have an income of 854 thousand rupiahs greater than those who do not use the internet for buying and selling activities. This is consistent with findings from (Pradiani, 2018) where online marketing media is very suitable for informal

business activities in the industrial sector, one of which is a home industry-based business.

The internet use variable for financial transactions has a coefficient of 2,140 and has a significant effect. This indicates that informal entrepreneurs in the manufacturing sector who utilize the internet for financial transactions earn an additional 2,140 million rupiah. The variable of using the internet for financial transactions shows a much higher coefficient than the purpose of using the internet or other variables. This shows that internet-based financial transactions are very beneficial for informal entrepreneurs in any business field because with internet-based financial transactions the transaction activities carried out will be easier and can be done anywhere so that it will be able to increase the efficiency of business activities in the informal sector.

CONCLUSION

Based on the results and discussion described in the previous section, it can be concluded that informal entrepreneurs who have higher assets, live in urban areas, are younger, and have higher education have greater opportunities to use the internet in three different destinations. However, there are differences in patterns of internet use between men and women based on their intended use. Male informal entrepreneurs have greater opportunities to use the internet to search for information and financial transactions, while female informal entrepreneurs have greater opportunities to use the internet for buying and selling activities. In addition, the use of the internet for information search, buying and selling activities, and financial transactions has a favorable impact on the earnings of manufacturing informal entrepreneurs.

From these findings, it is hoped that the government and related stakeholders will be able to formulate policies that can enhance internet usage, particularly in helping the commercial operations of informal entrepreneurs. With the positive effect of using the internet that is quite large, the government can launch programs to assist technology devices for informal businesses that will adopt internet use, expand the scope and distribution of the internet, especially in rural areas, and develop digital platforms that are easy for various groups to learn. Apart from that, it is necessary to formulate policies related to the security of digital transactions to support the utilization of the internet to conduct financial transactions.

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