

Internet User, Consumption and Employment in Agriculture in Indonesia

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Abstract

The number of people who use the internet annually is used to gauge internet literacy, consumption, and the impact of agricultural education on work engagement in agriculture. In order to accomplish this, data behavior is predicted using the Quantitative Threshold Autoregressive method. This allows for the observation of the behavior of the relationship between the data and the growth in work participation in agriculture, which is driven by education, as well as the rise in internet users and consumption in Indonesia. The job threshold variable in agriculture, Internet usage, and consumption is used to analyze the threshold variable, whereas education is the non-threshold variable. It is hoped that historical behavior data will serve as a predictor of future decision-making. We discovered that the internet is a technology that can raise farmers' productivity by more than 100% and increase consumer demand for agricultural goods based on the estimated results of the inclusion of the internet in Indonesia on people's consumption of agricultural products and the performance of farmers or people who work in the agricultural sector by 126 %. Where this can be achieved by encouraging education in the form of an increase in investment of 0.4%. These results suggest that the agricultural sector's progress in terms of production and distribution, as well as the convenience of consumer transactions for purchasing agricultural products in Indonesia, is significantly influenced by technology and education in the field.

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Introduction

Due to its direct connection to the nation's food security, the agricultural industry is receiving a lot of attention. Food security is obviously something that has to be worked on during a challenging pandemic like this one in order to prevent the food catastrophe that appears to be haunting Indonesia. This does not absolve Indonesia from the possibility of a food catastrophe in the future, either. Additionally, the COVID-19 pandemic's unclear phase will come to an end when its effects on agriculture become significantly apparent.

The swift advancement of technology in Indonesia has also brought to a shift in the spending patterns of households (Fatimah et al, 2020). The quick advancement of technology, which gave rise to several e-commerce businesses, has also increased retail sector consumption. Online sales of apparel and footwear products are still trending rapidly.. Business actors are also working to increase online sales. Digital transactions are nothing new around society. This can be seen from how many transactions are carried out through electronic transactions. The expansion of the e-wallet and e-money networks coupled with various conveniences and efficiencies has become a supporting factor for the development of digital transactions.

During the pandemic, Indonesia experienced a recession for two consecutive quarters. However, it turns out that at times of economic depression in Indonesia, the function of digital transactions is very dependable. During the epidemic, consumption through digital transactions is still rising, bringing fresh air for economic growth in Indonesia. In line with that, Indonesia, which is currently facing a pandemic, is experiencing an increase in digital transactions. This is also inseparable from the consumption made by the community through e-commerce which continues to increase every year (Gandasari & Dwidienawati, 2020).

To meet their daily needs, people now don't have to bother going to the shop. With the presence of e-commerce, starting from primary, secondary, and even tertiary needs, it can be obtained with one click on various internet platforms. Not to mention the many promos provided by e-commerce which certainly make people more interested in making transactions. Almost every month, various attractive promos such as free shipping, cashback, discount vouchers, and other promos are distributed to e-commerce users. To change the pattern of public transactions from conventional to digital, of course, easy access is needed. This is because not all digital transaction support facilities are available. More attention is needed for adequate infrastructure development. The most basic thing is the availability of the internet for all Indonesian people. If there is no adequate internet, digital transactions will certainly be impossible (Santoso & Erdaka, 2015). Community readiness is needed to respond to the rapid development of the internet. In the digital era, various types of information can be found easily. People must be observant to sort out what information is correct and what is not. Using a digital platform must be accompanied by balanced knowledge. In developing countries with people with low levels of education, digital literacy is a problem. In order to adapt to the internet's development, education is essential.

The digital economy, which is acculturation between information technology and the economy, requires a fairly high understanding. At least, digital economy players have a fundamental understanding of the use of technology and economic systems. Industries that carry artificial intelligence, giant data, the internet of/for things, financial and economic technology, and robotization have disrupted various previous innovations. Including innovation in agriculture. We are facing an era of disruption that brings fundamental and fundamental changes (the great shifting). The driving machine is the development of digital technology that changes all structures of human life. the push for the ease of digital transactions encourages ease of consumption in Indonesia, including the consumption of agricultural products (Şerbu, 2014).

The increase in consumption that comes from increasing internet inclusion in Indonesia needs to be responded to through education so that Indonesian human resources can be better prepared to adapt to changes in this digital era. Agriculture is a sector that cannot be abandoned because the food sector is an important sector and is a basic human consumption material. So that increasing internet literacy can also increase work participation, particularly in the field of agriculture (Paundra et al, 2020).

The State must be there to guarantee that those who become customers do not have trouble obtaining food since it is readily available and reasonably priced on the market. In order for farmers to be more profitable and productive as producers and to receive a fair price, the state must also be present. To achieve this, it is necessary to have the role of the state investing the state budget in the field of technology infrastructure which is getting better and is indicated by an increase in internet literacy, as well as the presence of the state is investing in human resources through education. This study examines the behavior of internet data inclusion, consumption, employment in agriculture, and education.

Literature Review

Large tracts of land are used for agriculture in Indonesia, where the majority of people work as farmers. Food security in Indonesia is created by the fact that, while being an agricultural nation with vast agricultural area and a majority of its inhabitants being farmers, the country cannot endure something simple. Food security can be realized when food production can be properly distributed so that it can encourage a production wave in the next period so that production growth occurs (Mehraban & Ickowitz, 2021). The means of distributing food are limited, resulting in less food production. In addition, with changes in people's lifestyles, automatically the demands of society as food consumers will also change. The cost of food items may fluctuate as a result. Food crises are still a possibility because the amount of food produced today has not altered significantly and may still be considered safe. The distribution of food is the main issue. Food distribution weakens under constraints. Food supplies are therefore not dispersed equally over all locations. Certain locations have a production shortage, while others suffer an excess of output (Rejeb et al., 2021).

The internet is one of the opportunities that can become a mainstay of food distribution during a pandemic. Technological advances today are very fast. Internet of Things (IoT) or also known as Industry 4.0 is an industrial revolution that relies on computerization and the internet in the process. Marketplace and Fintech (Financial Technology) are examples of products from this industry trend. The market acts as an intermediary or trade liaison between merchants and consumers by providing a digital market. In this market or digital market, farmers can sell their crops directly to consumers, both to traders in traditional markets and to end consumers (Halgamuge et al., 2021).

Millennials with a higher population will shift traditional consumption patterns in retail stores. Millennials who want practicality will prefer to shop online or use messaging-based applications. Pay later or later payment services will also become a millennial trend in using their funds. Retail stores also need to start incorporating the experience element of the shopping process. Millennials also more prefer to buy food or agriculture products by online-shop or e-commerce (Coderoni & Perito, 2021). Technology is one of the factors that play a role in encouraging food distribution. Equitable distribution of food can increase consumption and ultimately encourage production, which is marked by the increased absorption of labor in the agricultural sector, and of course, Education is necessary in order to raise the caliber of human resources in the agriculture industry.

Research Methods

The number of people who use the internet annually is used to gauge internet literacy, consumption, and the impact of agricultural education on work engagement in agriculture. In order to accomplish this, data behavior is predicted using the Quantitative Threshold Autoregressive method. This allows for the observation of the behavior of the relationship between the data and the growth in work participation in agriculture, which is driven by education, as well as the rise in internet users and consumption in Indonesia. The job threshold variable in agriculture, Internet usage, and consumption is used to analyze the threshold variable, whereas education is the non-threshold variable. It is hoped that historical behavior data will serve as a predictor of future decision-making. Here is how the autoregressive equation was applied in this study:

$$AR_{(p)} = Y_t = c + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + e_t$$

In a time series, where AR is Y and Yt is Y over time, Yt-1, or Y over time in the past, influences Yt-1 itself, which in turn influences Yt-2, or Y in the past, which influences Yt-2, and so on, all of which are impacted by et, the error term for the time in the study period. The secondary data used in this study came from the World Bank. Using the following econometric equation:

$$C_t = \beta_0 + \beta_1EA_{t1} + \beta_2Ed_{t2} + \beta_3IT_{t2} + e_t$$

Where e is an error term, t is a time period, β is constant, Ed is an investment in agricultural education, IT is an internet user, and C represents consumption. All information is secondary and comes from global banks.

Results And Discussion

The job threshold variable in agriculture, Internet usage, and consumption is used to analyze the threshold variable, whereas education is the non-threshold variable. Table 1 below displays the estimates results from the initial estimate:

Table 1. Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Threshold Variables (linear part)				
C	1.40E+10	3.24E+10	0.431193	0.6777
INTERNET_USER	-1133.313	1010.106	-1.121974	0.2944
EMPLOYMENT_IN_AGRICULTURE	6644.949	660.1451	10.06589	0
Threshold Variables (nonlinear part)				
C	6.95E+11	3.53E+11	1.96727	0.0847
INTERNET_USER	2901.832	760.4466	3.815958	0.0051
EMPLOYMENT_IN_AGRICULTURE	-8363.827	3115.202	-2.684843	0.0277
Non-Threshold Variables				
EDUCATION	0.423707	0.968551	0.437465	0.6733
Slopes				
SLOPE	2.65E-11	2.03E-11	1.306587	0.2277
Thresholds				
THRESHOLD	5.25E+11	4.21E+10	12.47826	0
R-squared	0.999702	Mean dependent var	5.33E+11	
Adjusted R-squared	0.999404	S.D. dependent var	1.31E+11	
S.E. of regression	3.19E+09	Akaike info criterion	46.9088	
Sum squared resid	8.14E+19	Schwarz criterion	47.34991	
Log likelihood	-389.7248	Hannan-Quinn criter.	46.95265	
F-statistic	3354.248	Durbin-Watson stat	1.05863	
Prob(F-statistic)	0			

Source : Data world Bank Compiled

It is evident how internet users' income, work in agriculture, and education are related to each other with consumption is positive with a value of 6644,949 for Employment in Agriculture on the linear part and 2901,832 for internet users in the non-linear part and 0.423707 for education

at the non-threshold. However, Internet users and employment in agriculture are negatively related to consumption with an estimated value of -1133.313 for internet users in the linear part, and employment in agriculture in the non-linear part of -8363,827. This means that when education investment in agriculture increases by 0.4%, It will motivate more people to take on jobs in employment in agriculture by 6645 people, when 6645 people work in the agricultural sector there is a decrease in internet users of 1133 people. Over time, with the same level of investment in education, there has been an increase in internet users, which is an indicator of technology absorption and adaptation in Indonesia, there has been a decrease in the number of workers due to technological factors that make human performance more efficient by 8364 people divided by 6645 people or there is an efficiency of human resources by 8364 people divided by 6645 people. 126%, which means that assuming the same number of workers or not changing, there will be a production push of 126% which is responded to by a consumption boost of 126%. All variables are considered significant or have a significant effect when the estimation results are compared to the t-statistic value, and this is supported by a degree of confidence of R-Squared 0.999702 or 99%, which indicates that the results can be trusted with an error of less than 5% or less than α of 0.05. The following graph presents a projection of the impact of investing in agricultural education in order to ascertain how data behave in impacting Employment Income in Agriculture:

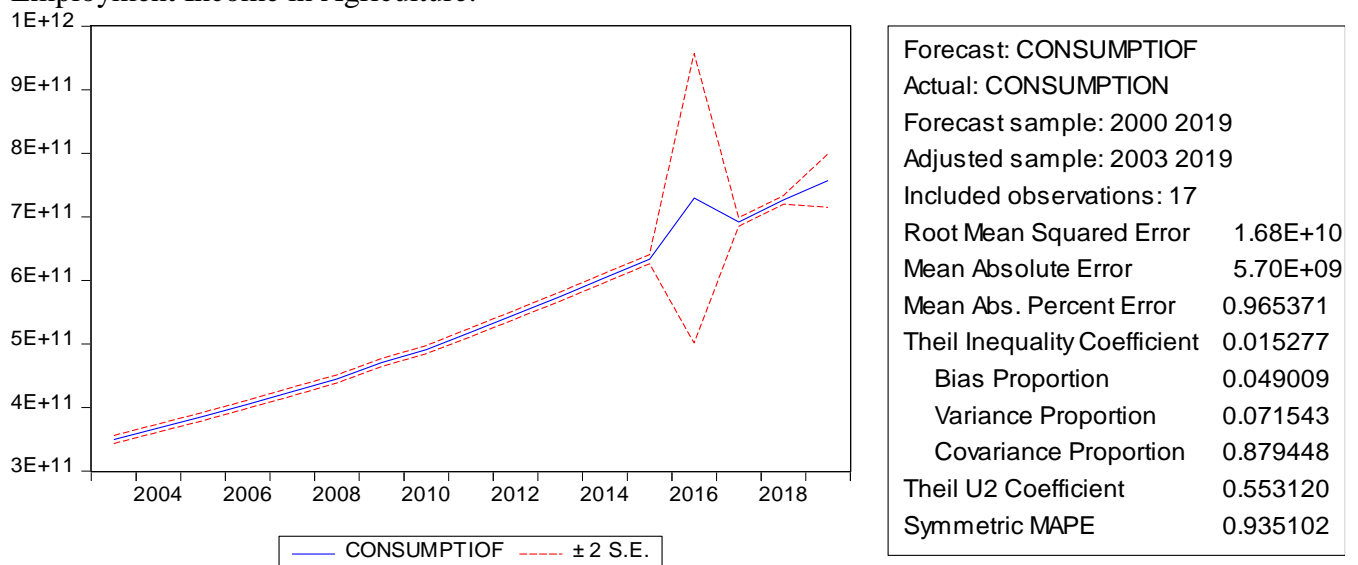


Figure 1. The outcomes of Indonesia's employment income forecasts in agriculture
 Source : Data world Bank Compiled

Based on the forecast findings displayed in Figure 1, it is evident that the consumption graph has a periodic upward pattern, with fluctuations observed between 2014 and 2016. where the forecasted results are predicted using Indonesia's adoption of technology, investment in education, and labor absorption in the agriculture sector. This shows that the Internet and human capital play a role in improving or developing agriculture in Indonesia where the Internet encourages consumption and production, education encourages in terms of production and policies as well as consumer confidence in buying agricultural goods or products online.

Conclusion

The internet is a technology that can increase people's consumption of agricultural products while helping farmers to work more efficiently with a boost of more than 100% based on the estimated results of the inclusion of the internet in Indonesia on people's consumption of agricultural products and the performance of farmers or people who work in the agricultural sector by 126 %. Where this can be achieved by encouraging education in the form of an increase in investment of 0.4%. These results suggest that the agricultural sector's development—both in terms of production and distribution, as well as the convenience of consumer transactions for the purchase of agricultural products in Indonesia—is significantly influenced by technology and education in the field.

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