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Impact Analysis of Digital Divide on Food Security and Poverty in Indonesiain 2015-2017

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Abstract. *The purpose of this study is to analyze the impact of the digital divide on food security and poverty in Indonesia. The data were taken from the Indonesian Central Bureau of Statistics (Badan Pusat Statistik) from 2015 to 2017. This research used a quantitative method using Structural Equation Model (SEM). Digital divide, Food security and Poverty were the latent variables that were used in this research. The result of this study shows that the digital divide had a significant positive impact on food security while the impact of food security on poverty was negatively significant with the coefficient 0.894 and -0.616 respectively. There was no significant impact of the digital divide on poverty directly. It means that technology doesn't have any significant contribution to Poverty reduction in Indonesia. However, when the reduction from the data was conducted, and only specific province who have good ICT development were used, the result was different. ICT development had a significant impact to reduce poverty in Indonesia.*

Keywords: *Digital divide, poverty, food security, SEM, Indonesia.*

Abstrak. *Penelitian ini bertujuan untuk melakukan analisis pengaruh kesenjangan teknologi terhadap ketahanan pangan dan poverty di Indonesia. Data yang digunakan untuk keperluan analisis adalah data sekunder yang didapatkan dari Badan Pusat Statistik (BPS) sejak tahun 2015 hingga tahun 2017. Penelitian ini menggunakan pendekatan kuantitatif dengan menggunakan metode Structural Equation Model (SEM). Variabel laten yang digunakan untuk analisis ini adalah Kemajuan Teknologi, Kemiskinan, dan Ketahanan Pangan. Berdasarkan hasil penelitian, Kemajuan Teknologi berpengaruh secara positif dan signifikan terhadap Ketahanan Pangan dengan nilai koefisien 0.894, sementara ketahanan pangan berpengaruh negatif dan signifikan terhadap nilai kemiskinan dengan nilai koefisien sebesar -0.616. Tidak ada pengaruh signifikan antara variabel kemajuan teknologi terhadap kemiskinan secara langsung. Hal ini berarti bahwa kontribusi teknologi masih belum berpengaruh secara signifikan terhadap pengentasan kemiskinan di Indonesia.*

Kata kunci: *Kesenjangan teknologi, kemiskinan, ketahanan pangan, SEM, Indonesia*

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Introduction

Poverty is one of the problems in Indonesia. Indonesian people below the poverty line are 25,144,720 people (Badan Pusat Statistik, 2018). One of the important components related to community welfare is food security, among other problem in the society such as job opportunity, purchasing power, and availability of products and services(Brauw & Suryanarayana, 2015). The Ministry of Agriculture (2018) divides food security into 3 aspects, namely 1) Availability, 2) Affordability, 3) Utilization(Toni, Candra, Rachmaning, Prayitno, & Maulana, 2018). This means that food security is not only about the availability of food commodities––––''''(OConnor, Farag, & Baines, 2016), but also considers the quality of nutrition and equitable distribution at affordable prices for all levels of society(Ali, 2017).

Industrial Revolution 4.0 is an era in which the development of technology has an extraordinary impact on human life(Kumar & Prasad, 2004). This technologydevelopment presumably can strengthen food security and reduce poverty in Indonesia. For example, with quick access to communication and information(Biancone, Secinaro, & Kamal, 2019), projecting the amount of demand and supply of domestic food commodities will be easier. This can be seen if the amount of demand and supply of goods is provided by domestic industries and consumed by the domestic community as (Elseidi, 2018). Technology development will also encourage new research studies to optimize the production of food commodities in Indonesia and with the internet access(Lenagala & Ram, 2010), the public will also find it easier to access various kinds of information needed to overcome the problems existed.

Technology developments also have a role in poverty reduction–––(Chhibber & Nayyar, 2008), the presence of advances in information technology can be utilized to empower the communityand income distribution''''(Zaki, Widiastuti, Yudha, Wijayanti, & Miraj, 2020). The Government of Indonesia through the National Development Planning Agency (BAPPENAS) has created a system called the Integrated Poverty Planning''''(Sung, Leong, Sironi, OReilly, & McMillan, 2019), Budgeting––''''–'''–'(Hazera, Quirvan, & Marin-Hernandez, 2016), Analysis and Evaluation System (SEPAKAT) which aims to manage data to map the problems that cause poverty in the community(Chamboko, Re, & Guvuriro, 2017), with that system the government can determine what strategies are suitable for alleviating existing problems to reduce poverty(Wang, Liu, Yao, & Xin, 2009).The contribution of technological progress has an important role and is a solution to the problem of food security(Bastos, Fernandes, & Passos, 2004), and poverty in Indonesia—(Thomson Reuters and Dinar Standard, 2018).

However, Indonesia is a vast country with diverse geographical conditions, infrastructure and human resources—(Thomson Reuters and Dinar Standard, 2018). Therefore, there is a gap in the development of technology in Indonesia. To be able to obtain the benefits of these technological advancements, it takes quite a thorough preparation in various aspects(Habibi & Candra Yudha, 2017), ranging from the availability of infrastructure that allows the public to be able to access the internet '–(Tajerin, Sastrawidjaja, & Yusuf, 2017), experts in the field of technology and of course the people's ability to be able to utilize the technology'(Nastiti & Kasri, 2019). Regions that have access to adequate technology and infrastructure should be able to minimize poverty levels(Streukens & Leroi-Werelds, 2016).

The study that investigates the impact of technology on poverty and food security were scarce. This study tried to fill in the gaps and aims to provide empirical evidence of the influence of technological disparities on food security and poverty in Indonesia by the year 2015 to 2017.

Digital Divide and Food Security

Technology in agricultural industry has strategic roles to increase national food security. Agricultural technology has a significant roleon increasing food productivity, increasing diversification in the type and quality of food, increasing added value, employment opportunities, and preserving natural resources and the environment. With the t technology, production efficiency can be increased thereby increasing the competitiveness of food products in the country and in the international market' (Suryana, 2014).This hyphotesis was also supported by anotther study which prove that there is a relationship between the adoption of agricultural technological innovations with the level of resilience of farm households (Fatchiya, Amanah, & Kusumastuti, 2016)

Hypothesis 1 : Digital Divide has a relationship with Food Security

Digital Divide and Poverty

Yekini considered that ICT had a positive impact on the rate of poverty reduction, with the confirmation of adequate infrastructure, the development of ICT made it possible to create innovations aimed at increasing income, access to education, community empowerment and public services. Internet and cell phone penetration also contributes to the rate of poverty reduction(Yekini, Rufai, Adetoba, Akinwole, & Ojo, 2012).

Litan & Alice in their empirical study stated, the internet has the potential to increase productivity in different sectors, but mutually reinforcing in various ways, namely: 1) reducing the transaction costs of production and distribution of goods and services, 2) increasing management efficiency in production chain communication from suppliers to consumers, and 3) increase competitiveness, transparency, expansion of market space(Litan & Rivlin, 2001). It is concluded that mobile phones contribute to improve rural livelihoods and reduce poverty by providing rural households with fast and easy modes of communication, thereby increasing their ability to access livelihood assets, undertake diverse livelihoods strategies, and overcome their vulnerabilities(Sife, Kiondo, & Lyimo-Macha, 2010). It is clear the deployment of mobile phones does have a multi-dimensional positive impact on sustainable poverty reduction""(Bhatia, D., Bhavnani, A., Won-Wai Chiu , R. , Janakiram, S., Silarszky, 2008)

Hypothesis 2 : Digital Divide has a relationship with Poverty

Food Security and Poverty

According to Siregar, the increased consumption of food (mainly rice) in the poor households roup will have a significant effect on their level of welfare, which is usually measured by the amount of food expenditure. Which means that with a higher level of food security, this gives an indication that the level of welfare will also be higher(Siregar, 2009).

At a macro level, food security can affect poverty levels. In Regmi and Maede's research, one aspect of food security is the price of food commodities and when there is an increase in the price of food commodities will cause a decrease in people's welfare which will affect global economic conditionsIn the previous study, there was an empirical evidence that the welfare leve has a positive and real relationship with the level of food security of poor fishermen households in both the typology of poverty in urban and rural coastal areas(Regmi & Meade, 2013)

Hypothesis 3 : Food Security has a relationship with Poverty

Research Methodology

This study used a quantitative approach using *Structural Equation Model* (SEM)'(Contreras Pinochet, Diogo, Lopes, Herrero, & Bueno, 2019). The variables that were used in this study were given in table 1.

Table 1.
Variables

Variable	Code	Description	Unit
Laten t endogen	$\eta_{Poverty}$	Poverty	percentage
Indicator	X1	Number of Poor people	percentage
	X2	Poverty Depression Index P1	percentage
	X3	Poverty Depression Index P2	percentage
Laten t endogen	$\eta_{food\ security}$	Food Security	
Indicators	X4	Average community energy consumption	nominal
	X5	Average portion of community food expenditure	Percentage
	X6	the percentage of people who have access to electricity	Percentage
	X7	The average length of study for people with> 15 years of age	nominal
	X8	Percentage of people who have access to sustainable water	Percentage
	X9	Percentage of toddlers aged 0 -59 months who are affected by malnutrition	Percentage
	X10	Life expectancy	nominal
Laten tExogen	ξ_{ICT}	ICT	
Indicators	X11	Digital Divide Index	Index
	X12	Percentagetase people who access the internet last 3 months	Percentage
	X13	Percentagetase people who master computers	Percentage
	X14	Percentagetase people who control cell phones	Percentage

*Data Gathering*The data used in this study is secondary data, where secondary data is data obtained indirectly or through intermediary media. In this study the data used is panel data at the provincial level in Indonesia and obtained from the publication of the Central Statistics Agency (BPS), the Ministry of Health and the Ministry of Agriculture in the period 2015 - 2017. There are 34 province in Indonesia, therefore there are 34 set of data for each variables.

Data Processing
After the data for each variable is collected then statistical analysis is performed to test the hypothesis and answer the formulated problem. The analytical method used is the Structure Equation Model (SEM) method and the software used was SmartPLS. There are two approaches in the Structure Equation Model (SEM) method(Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014), namely covariance-based SEM (Covariance Based-SEM, CB-SEM) and SEM with variance approach (VB-SEM) with Partial Least Squares (SEM-PLS) techniques(Usakli & Kucukergin, 2018).

In this study, the SEM method used is the SEM-PLS method because it is more dynamic in analyzing economic data———"–(Svensson, 2015). SEM-PLS is not only used to test the theory but can also be used to confirm the influence test that does not yet have a theoretical basis because in its application it is not necessary to scale up to large data and test statistical assumptions (Hanna, 2017).

The advantage of using SEM analysis is that it can test the relationship between variables in more than one direction(Pişirir, Uçar, Chouseinoglou, & Sevgi, 2019) because SEM is included in the multivariate statistical method that allows analysis of more than one independent variable in the form of latent variables (Hanna, 2017).

There are several steps in conducting an SEM-PLS analysis. The following are the steps in conducting the SEM-PLS test:

1. *Determine the Inner Model*

The inner model is the first step taken in conducting the SEM-PLS test–'—"—(Richter, Sinkovics, Ringle, & Schlägel, 2016). Inner model is to make a structural model of the relationship between latent variables that are based on the formulation of the problem and the hypothesis that has been determined.

2. *Determine the Outer Model*

After determining the structural model the next step is to design a measurement model or Outer Model. The objective of determining this measurement model is to identify whether the indicator falls into the category of indicators:reflective or formative. Reflective indicator variables are variables that reflect latent variables. While formative indicator variables are variables that cause latent variables (Siswoyo, 2017)

The indicators in this study use both categories of indicator properties. For poverty and ICT variables, the nature of the indicator is reflective, while for the food security variable the indicator's nature is formative.

3. *Arrange a Path Diagram*

After the process of identifying indicator variables, the next step is to refine the SEM-PLS model by compiling a path diagram, so that the flow of the analysis process is easier to understand. Next is the final model that already consists of inner model, outer model and is connected with a path diagram between variables

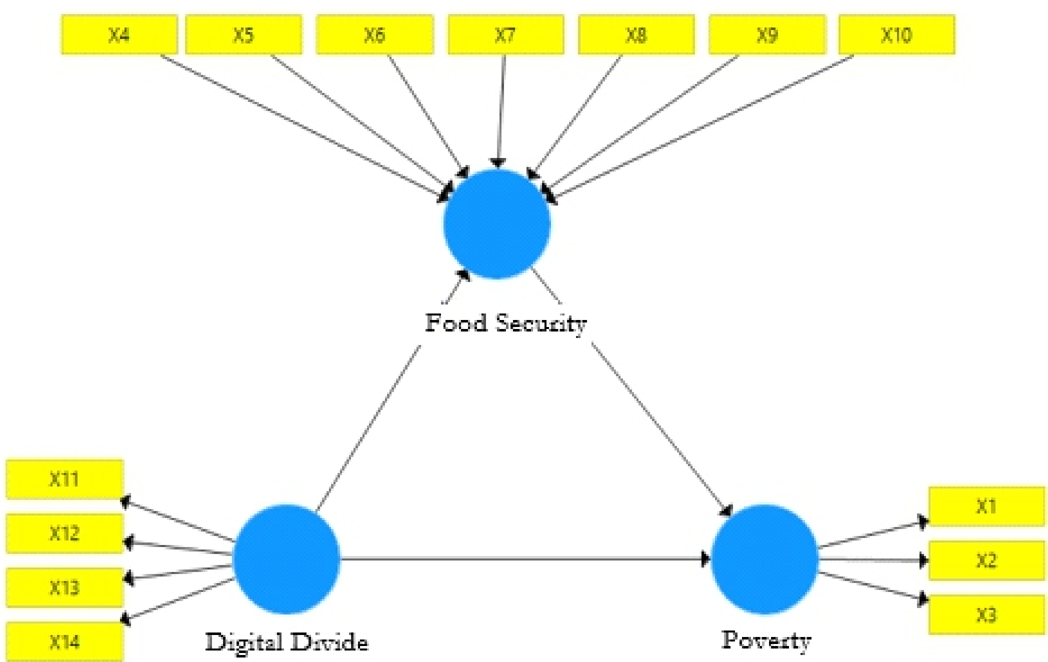

Figure 1.
Hypothesis Model

1. *Converting a Path Diagram Into mathematical Modelling*

To find out how significant the relationship between latent variables with indicators and latent variables with other latent variables, a measuring tool called the measurement model method is used. In carrying out the measurement model test, mathematical equations are needed. Following is the form of SEM-PLS model conversion in Figure 3.1 into mathematical equations:

a). Outer model

There are 3 outer models in the SEM-PLS model research this time:

1. Digital divide: latent variable with reflective indicators:

$$\begin{bmatrix}\chi 11\\ \chi 12\\ \chi 13\\ \chi 14\end{bmatrix} = \begin{bmatrix}\lambda\chi 11.\xi_{ICT}\\ \lambda\chi 12.\xi_{ICT}\\ \lambda\chi 13.\xi_{ICT}\\ \lambda\chi 14.\xi_{ICT}\end{bmatrix} \xi_{ICT}$$

2. Poverty: latent variable with reflective indicators:

$$\begin{bmatrix}\chi 1\\ \chi 2\\ \chi 3\end{bmatrix} = \begin{bmatrix}\lambda\chi 1.\eta_{poverty}\\ \lambda\chi 2.\eta_{poverty}\\ \lambda\chi 3.\eta_{poverty}\end{bmatrix} \eta_{poverty}$$

3. *Food Security: latent variable with formative indicators*

$$\eta_{food\ security} = \lambda\chi 4.\eta_{food\ security} + \lambda\chi 5.\eta_{food\ security} + \lambda\chi 6.\eta_{food\ security} + \lambda\chi 7.\eta_{food\ security} + \lambda\chi 8.\eta_{food\ security} + \lambda\chi 9.\eta_{food\ security} + \lambda\chi 10.\eta_{food\ security}$$

Description :

λ = the loading factor value from the indicator to the latent variable

b. Inner model

The equation of relationship between latent variables in the SEM-PLS model research:

$$\eta_{poverty} = \beta_{\xi_{ICT}} + \gamma_{\eta_{food\ security}}$$

$$\eta_{food\ security} = \beta_{\xi_{ICT}}$$

$$\eta_{poverty} = \gamma_{\eta_{food\ security}} \times \beta_{\xi_{ICT}}$$

Description :

γ = the path coefficient of the exogenous to endogenous variable regression

β = pathway regression coefficient for endogenous to endogenous variables

2. PLS Testing Model

a). *Outer model*

In the PLS model, there are two methods used to measure the significance of indicators of their latent variables. The use of measurement methods must be adjusted to the nature of the relationship between the indicator and its latent variables.

Reflective

For the constructs which have a reflective relationship between the indicator and its latent variable, the value that needs to be considered are*outer loading, composite reliability* dan *average variance extracted* (AVE). The constructswill be stated significance if*outer loading*value> 0,7.

Discriminant validity is comparing the value of the square root of average variance extracted (AVE) latent variable to the indicator with the value of other latent variablesif the square root of average variance extracted (AVE) latent variable to the indicator is greater than the correlation with all other latent variables in one model, it is said that the latent variable has good discriminant validity. Recommended measurement values must be greater than 0.50. Composite reliability is a reliability test in PLS which shows accuracy on choosing a measuring instrument. Latent variables are said to have good reliability if they have values> 0.70.

Formative

For formative indicators, the value that needs to be considered are*outer weight* dan *collinearity statistic* (VIF).

Outer weight value is used to compare which indicator has the biggest contribution in the construct. The requirement for indicators to be used in constructs that have the nature of formative relationships is that there is no high multicollinearity among the indicators used.

Therefore the VIF value of the indicator in the formative construct must be <10 to be used in the model.

a). *Inner model*

Goodness of fit (GOF) on SEM-PLS was measured using R-Squared (R^2). R-Squared (R^2) value is used to test the impact value between these variables.If the value of $R^2 \geq$ 0,15 then the relationship is not significant enoughif the value of $R^2 \geq$ 0,33 then the impact is moderate and if the value of $R^2 \geq$ 0,7 then the impact is significant.

3. *Hypothesis Test*

The hypothesis was tested by bootstrapping resampling method. The value that must be considered in the bootstrap resampling method is the t-statistics value to find out whether the relationship between the variables tested is significant or not. If the value of t-statistics> 1.59 then there is a significant relationship between variables.

Furthermore, to see the value the relationship between the two variables can be seen in the path coefficient value column. If the coefficient value is positive then the relationship between the two variables is positive and if it is negative then the relationship between the two variables is negative.

Results

After calculating using the help of smartPLS software, the following results are obtained:

b). Outer Model

Validation of the measurement model on the outer model aims to determine whether the indicators that have been determined can explain the latent variables. There are two relationship indicators with latent variables in this study, namely formative and reflective. The method used to test the outer model in the SmartPLS application is to do the PLS Algorithm test. Here are the PLSAlgorithmtest result

a. Reflective Measurement Model

Latent variables that have a reflective relationship with the indicators in this study are the latent variables of ICT and Poverty. The following are the results of outer model measurements on the ICT and Poverty variables

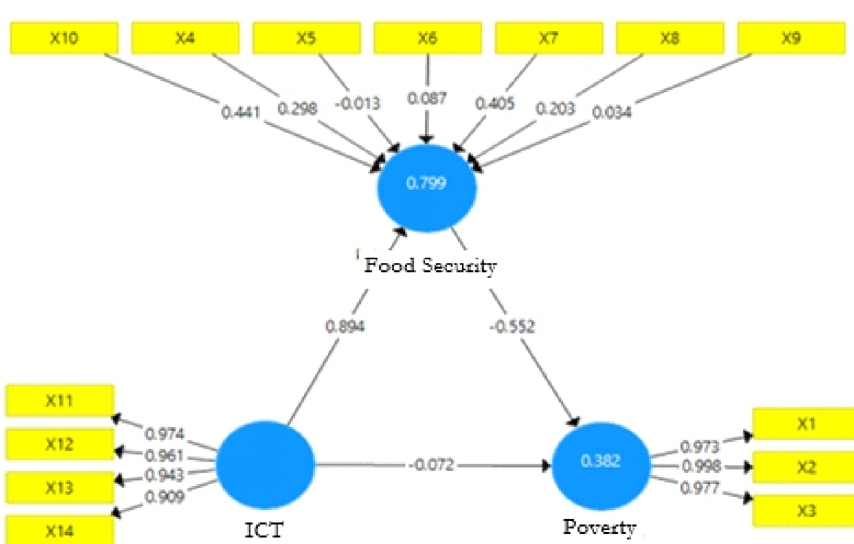

Figure 2.
PLS Algorithm Result

Table 2.
Value of Loading the Indicator in The Poverty Variable

Indicator		Loading	Information
Number of poor people		0.973	Valid
Poverty depression index	PI	0.998	Valid
Poverty depression index	P2	0.977	Valid

Based on the measurement results in the table above shows that the number of poor people (X1), poverty depth level (X2) and poverty severity (X3) can be relied upon to explain latent poverty variables. The value of composite reliability and AVE in this study is 0.988 and 0.966, which means that each indicator is determined other than can reliable also has a high consistency to explain latent poverty variables. Here is a mathematical model for measuring the poverty variable construct:

$$\begin{bmatrix} \chi 1 \\ \chi 2 \\ \chi 3 \end{bmatrix} = \begin{bmatrix} 0.973 \\ 0.998 \\ 0.997 \end{bmatrix} \eta_{poverty}$$

Table 3.
Value of Loading Indicators in ICT Variables

Indicator		Loading	Information
Digital divide index		0.974	Valid
Percentagetase of people who access the internet in	the last 3 month	0.961	Valid
Percentage of people who master computer		0.943	Valid
Percentage of people who control cell phone		0.909	Valid

Based on the measurement results in the table above shows that the index of IPTIK growth index (X11), the number of people who have accessed the internet (X12), the number of people who master computers (X13) and the number of people who control cell phones (X14) can be relied upon to explain latent variables poverty. The value of composite reliability and AVE in this study are 0.972 and 0.896, which means that each indicator determined is not only reliable but also has a high consistency to explain latent poverty variables. Here is a mathematical model for the IPTIK variable construct:

$$\begin{bmatrix} \chi 11 \\ \chi 12 \\ \chi 13 \\ \chi 14 \end{bmatrix} = \begin{bmatrix} 0.974 \\ 0.961 \\ 0.943 \\ 0.909 \end{bmatrix} \xi_{ICT}$$

a. Formative measurement model

Latent variables that have a formative relationship with the indicators in this study are latent variables of food security. Following are the results of outer model measurements on the food security variable.

Table 4.
Indicator Weight and VIF Values in Food Security Variables

Indikator	Weight	VIF	Keterangan
The Average community energy consumption	0.298	1.554	Valid
The Average portion of community food expenditure	-0.013	1.400	Valid
Average of people who have access to electricity	0.087	2.481	Valid
The Average length of study for people with > 15 years of age	0.405	1.445	Valid
Percentage of people who have access to sustainable water	0.203	1.695	Valid
Percentage tase of toddlers aged 0-59 months who are affected by malnutrition	0.034	1.202	Valid
Life expectancy	0.441	1.947	Valid

In the latent variable construct of food security, each indicator that has been determined has a VIF value <10, which means that in the construct, there are no high multicollinearity symptoms and it can be said that all indicators can explain the latent variable. Here is the mathematical calculation of the construct of the food security variable.

$$\eta_{\text{food security}} = 0.298X_4 - 0.013X_5 + 0.087X_6 - 0.045X_7 + 0.203X_8 - 0.034X_9 + 0.441X_{10}$$

2. *Inner Model*

The purpose of the inner model test is to test the structure and determine the relationship between the latent variables in the model. The method used in the SmartPLS application to determine the relationship between latent variables or test hypotheses was done by calculating Bootstrapping. Figure 3is the results of structural tests with Bootstrapping calculations in the study of the influence of technological progress on food security and poverty levels.

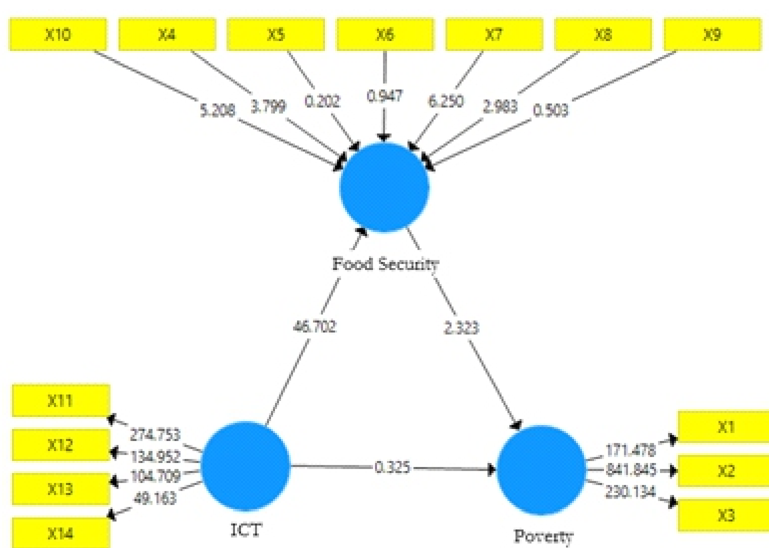

Figure 3.
Calculation Results of the *Bootstrapping Method*

Table 5.
Value of Influences between Latent Variables

Path	Direct	Indirect	t-statisti c	P Values
Food Security → poverty	-0.552	-	2.448	0.01 5
ICT→Food Security	0.894	-	42.05	0.000
ICT→Poverty	**-0.07 2**		**0.3 59**	**0.7 20**
		-0.494	2.4 33	0.01 5

a. *The effect of food security and ICT onpoverty*
When testing the path coefficient of the relationship between the development of ICT it turns out that it is not as significant as that because the path of the ICT development variable relationship to poverty is removed. Here are the results of structural tests on poverty variables.

$$\eta_{poverty} = -0.552\ \eta_{food\ security}$$

Based on the measurement results above it can be seen that the t-statistic value is known to be greater than 1.59 with a value of 2,448 which means that food security influences poverty. The form of influence that was formed was negative at 0.552 and the value of R2 for the food security variable was included in the moderate influence category with a value of 0.38 indicating that the food security variable could explain 38% of the latent poverty variable.

b. The Impact of ICT on Food Security
Following are the results of structural tests between the development of IPTIK on food security

$$\eta_{food\ security} = 0.894\ \xi_{ICT}$$

Based on the measurement results above, it can be seen that the t-statistical value is 42.96 which means that food security influences poverty. The shape of the influence formed is positive at 0.894 and the value R2 = 0.798 shows that the ICT variable can explain 79.8% of the latent variables of food security.

c. The influence of ICT on poverty through food security
The following are the results of structural tests of the development of ICT on poverty through food security

$$\eta_{poverty} = -0.552\ \eta_{food\ security} \times 0.894\ \xi_{ICT}$$

Based on the measurement results above, it can be seen that the t-statistic value is 2,433 which means that ICT can influence poverty through food security. The form of influence formed is negative at -0.552

Discussion

Based on data from 2015 to 2017, technological advances still do not have a significant contribution directly to poverty in Indonesia. However, the potential and opportunities for digital economic development in Indonesia are enormous. Based on data recorded from katadata.co.id, the value of digital economic transactions in Indonesia reached $ 133 billion, or around Rp 1,826 trillion in 2025, surging from the 2019 projection of US $ 21 billion(Jayani, 2019).The technology gap still occurs in most regions in Indonesia, only a small proportion have a fairly low level of the technology gap.

Based on data released by APJII, the growth of internet users is growing rapidly each year to reach 10%. In 2017 the number of internet users in Indonesia ranged from 171.17 million out of 264.14 million inhabitants. In 2018, the number of internet users will then increase to 199.6 million populations.

This figure is projected to continue to increase over the year. Seeing this potential, if it is utilized properly, the significant impact of ICTon food security and poverty is likely possible in the next few years. However, this is must be followed by triggering ICT to incubate creative economy industry and make sure that the development of facilities and infrastructure are well performed in all areas. Therefore,the significant impact of ICTon food security and poverty is likely possible. the result align with previous study(Siregar, 2009)(Regmi & Meade, 2013)

The result of this study was align with previous study that there is a relationship between technology development and food security' (Suryana, 2014). Technology development in agriculture has an important role to increase the production as well as the farmers livelihoods. Therefore, it is considered both urgent and consequentials(Bronson & Knezevic, 2019)

There is no significant direct impact was found between the level of the digital divide and poverty.This result wasn't align wih pervious study which prove that there was relationship between technology and poverty(Yekini et al., 2012)(Wang et al., 2009)(Chamboko et al., 2017). Technology was considerd as the opportunity to gain compete advantage in the New Economic era.(Greene, 2016).

From the second analysis, this might happened because the ICT development among different provinces in Indonesia was highly divided. One of the factors that caused technological progress cannot directly affect poverty levels in Indonesia is the high gap that exists in each region in Indonesia. The following is the ICT growth index data between the provinces that are in Java and the provinces outside of Java.

Table 6.
ICT Growth Index Data in Indonesia

Province	Year			Average
	2015	2016	2017	
Province on Java Island	5.67	5.85	6.18	5.90
Province outside of Java Island	3.63	3.99	4.54	4.054

Based on the results of the data above, it can be seen that there is a large gap between the provinces in Indonesia in terms of technological growth, this is why technology does not have a major impact on poverty levels in Indonesia. To find out whether technology can affect poverty levels directly, an SEM-PLS test was carried out again with a predetermined model that is looking for the influence of technological progress on food security and poverty but using a narrower scale of data that only uses data on provinces in Java,since these provinces have a greater technological growth index and dominate among other provinces in Indonesia, the following are SEM-PLS test results for provinces in Java.

Table 7.
Results of SEM-PLS Bootstrapping Test in Java Island

Path	Direct	t-statistic	P Values
Food security → poverty	-1.854	4.202	0.000
ICT → Food Security	0.934	21.91	0.000
ICT → Poverty	-1.022	3.782	0.000

Based on the bootstrapping test results above, it can be seen that if using data scale only in Java, technological progress can directly influence poverty levels without mediating other variables, because the t-statistic value and P Values meet the requirements that prove that the direct relationship between the two variables significant effect.

The data used in this study was very limited, which is from 2015 to 2017. Therefore, the panel data was used. For further studies, it is highly recommended to use wide range of data in time series. Individual analysis from various province in Indonesia would be very interesting to be explored and compared. The model could also be developed further by adding some other latent variables such as the Human Development Index or economic growth. Cross-sectional studies would be interesting to be done with various factor technology development.

Conclusions

Based on data from 20015-2007, there is a significant influence between technological progress and food security. Meanwhile, food security also had a significant negative impact on poverty. Poverty wasn't directly affected by technology development. However, when the calculation was modified only on the selected province which has a significant ICT development the result shows that the impact on poverty was significant and this align with those previous studies. Finally, from this study, it is concluded that bridging digital divide is important not only to increase food security but also expected to reduce poverty in Indonesia.

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