

THE ROLE OF DIGITAL TRANSFORMATION TO ECONOMIC GROWTH IN THE PROVINCES OF SOUTH SUMATRA, ACEH, AND LAMPUNG

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Abstract

The development of digital transformation is critical for innovation and surviving the crisis and being a sustainable focus. This study aims to observe the relationship between digital transformation and selected macroeconomic variables in accelerating economic growth recovery at the regional level. The data used is panel data from 2018Q1 - 2020Q4 in three Sumatra provinces, namely South Sumatra, Aceh, and Lampung. The method used is Panel Vector Autoregression (PVAR). The results of this study confirm that internet uses and investment contribute to economic growth in three Sumatra provinces. From these results is recommended that the government need to develop digital access and understanding such as internet use in the three provinces of Sumatra, namely South Sumatra, Aceh and Lampung. This is in order to maximize the potential of existing economic growth.

Keywords: Digital Transformation; Economic Growth; Internet

JEL Classification: O30, E00, O32

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INTRODUCTION

The development of digital transformation is very important for innovation and surviving crises such as the Covid-19 pandemic as well as being a continuous focus on embracing the technology that allows it to develop after Covid-19 (Chatterjee, 2020; Myovella et al., 2020). During the global pandemic, digital technology has become an important enabler of connectivity that facilitates survival and connects people more than ever before. During the pandemic there is a prohibition against going out of the house, so people turn their attention more to computers and smartphones as saviors and tools to replace personal activities online. Digital transformation has the potential to be self-financing where in the early stages, digital transformation efforts can provide cost savings and increased efficiency that can fund investment in innovation, new business models, and accelerated growth (Ahmad et al., 2021; Indrawati et al., 2020; Wardhono et al., 2021).

Digital transformation can play a strong role in driving economic growth (Choy, 2020). Digital transformation affects the way economies and societies operate, driving changes in the scale, scope, and speed of business, and the structure of markets. Based on data released by the Central Statistics Agency (2020), in the second quarter of 2020, the Indonesian telecommunications sector grew by 10.88%. This condition can be a momentum for the telecommunications sector to expand. Meanwhile, the Indonesia Information and Communication Technology Development Index (ICT) in 2019 reached 5.32, an increase compared to the 2018 IP-TIK which was 5.07.

The ICT development index is a standard measure that describes the level of Information and Communication Technology (ICT) development of a region at a time, as well as measuring the digital divide and the potential for ICT development. [Figure 1](#) shows the position

of ICT development in Sumatra, where the value of ICT shows a high value (7.26-10.00), moderate (5.01-7.25), low (2.51-5.00), and very low (0.00-2.50). Based on [Figure 1](#), the Riau Archipelago is the province with the highest ICT with an ICT score of 6.14 in 2018 and 6.39 in 2019. While the 3 provinces with the lowest ICT are South Sumatra, Aceh, and Lampung with IP-TIK scores are 4.81, respectively; 4.66; 4.5 in 2018 and 4.9; 4.89; 4.82 in 2019.

Sustained efforts in the development of digital transformation lead to changes that will encourage consumption patterns and new socio-economic structures (Wardhono et al., 2019). The importance of development considerations arises from this, where the pressure on digital infrastructure development on developing or low- and middle-income countries to expand digital connectivity during the pandemic can ultimately lead to a decline in the quality and affordability of the internet. Some studies have linked higher broadband speeds to increases in GDP and productivity (Carew et al., 2018; Katz & Callorda, 2019). Recent evidence by the International Telecommunication Union (ITU) (2020) shows that countries with the most advanced broadband infrastructure can at least partially offset the negative effects of the pandemic. The converse also has a valid scenario, where a decline in broadband speeds could have an adverse impact on GDP, potentially contributing to a slowdown in convergence in countries around the world (Banga & Velde, 2018).

Theoretical studies that highlight the positive impact of technological developments on economic growth were carried out by Sassi & Goaid (2013); Ward & Zheng (2016); Cheng et al. (2020). Meanwhile, another study found that economic growth in many regional countries in the world was negatively affected by the diffusion of ICT (Pradhan et al., 2015; Yousefi, 2011). Focusing on developing countries, many previous

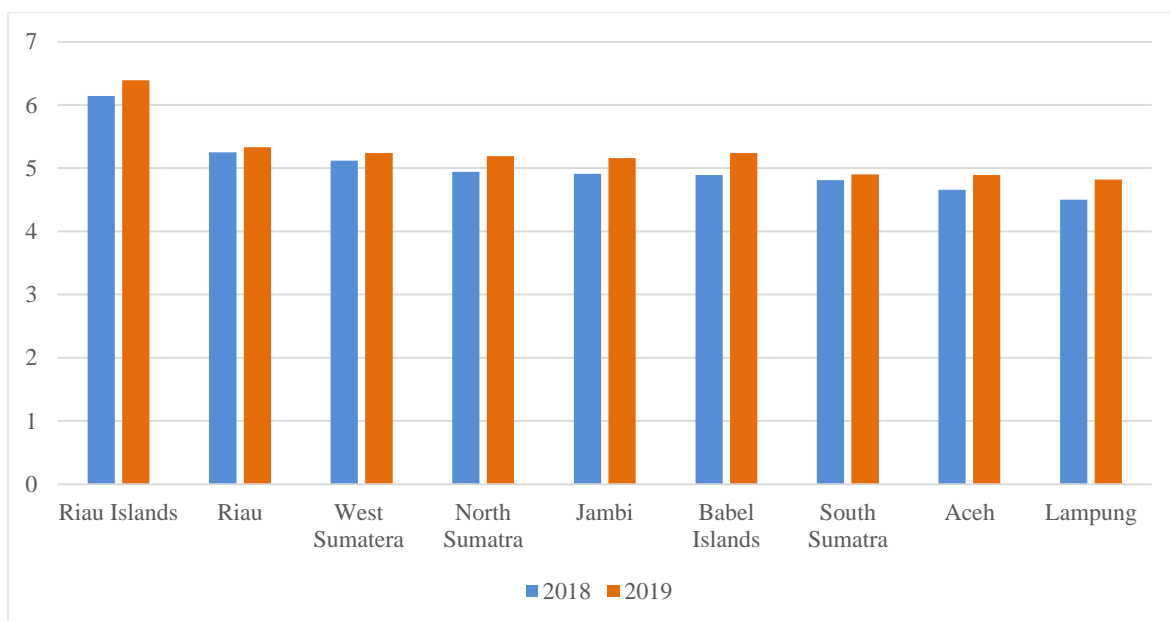
researchers have conducted empirical tests using different econometric models and using data across different regions/countries to understand the relationship between ICT diffusion and economic growth (Aghaei & Nasab, 2009; Sassi & Goaid, 2013; Pradhan et al., 2015). In previous studies, there have been mixed results and great disagreement among researchers regarding the question of the strong growth-enhancing effects of ICT diffusion on developing countries. Therefore, this issue needs to be investigated further.

Real digital transformation requires financial investment and public spending to achieve adequate levels of development and has several positive impacts on macroeconomic indicators (Mičić, 2017; Niebel et al., 2017). To further clarify this phenomenon, the authors re-examine the relationship between macroeconomic variables and economic growth by considering the relationship between finance and technology. This study aims to further analyze the relationship between digital transformation and selected macroeconomic variables in accelerating economic growth recovery at the regional level in selected Sumatran regions that are South

Sumatra, Aceh and Lampung in 2018Q1 – 20201Q1.

LITERATURE REVIEW
Theoretical Review

A theoretical study that discusses production factors that affect growth was pioneered by Solow (1956) known as the Solow growth model. This study then adopted the Solow model. In Solow's theory, it is explained that the growth of inputs in the form of production factors such as labor and capital can explain the growth of the output produced in the economy. In the Solow model, there is a popular term, namely "Solow Residual" which describes the factors of the growth of production factors that cannot be explained by either labor or capital that contribute to output growth. It can be said that the output growth is not only seen from the role of labor and capital but other factors also affect output such as culture, skills, physical and social infrastructure, skills, and others. These factors will increase if there is an increase in the quality of human resources in a country that can encourage the use of various accesses, one of which is access to information and communication technology.



Source: BPS, 2022 processed

Figure 1. ICT Development Index (ICT) Sumatra Region, 2018 – 2019

First, we start with the neoclassical growth model with the Cobb Douglas Function.

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \dots\dots\dots (1)$$

In this neoclassical growth model Y, K, L are already standard functions of output, capital, and labor. However, what should be noted here is A which describes changes in various factors that are assumed to be exogenous. This parameter will increase along with the rapid development of technology that drives the output to be greater. To calculate the total factor of production (TFP) we can adopt the Solow (1956) as follows.

$$\frac{\dot{A}_t}{A_t} = \frac{\dot{Y}_t}{Y_t} - \left(\alpha \frac{\dot{K}_t}{K_t} \right) + (1 - \alpha) \frac{\dot{L}_t}{L_t} \dots\dots (2)$$

In equation (2) we can calculate the total factors of production as a residual which can be calculated directly and data related to capital, labor and output must be available even though the share of production factors cannot be seen directly.

Empirical Review

Digital transformation is alleged to be an important actor in supporting future economic growth. The existence of digital factors such as the internet makes it easier for economic actors to carry out their activities. The direction is economic efficiency created from the use of existing resources. Several studies have also found that digital transformation in the form of ICT can increase economic growth. Asongu & Acha-Anyi (2020) that digital transformation in the form of information and communication technology (ICT) is driving economic growth in 25 sub-Saharan African countries. ICT increases the efficiency of the use of natural resources in the African region, which ultimately leads to an increase in Total Factors of Production (TFP) or output. This condition is also supported by a study from Sassi & Goaid (2013) explaining that information technology is fundamental in promoting the productivity process in a country as well as the value chain associa-

ted with that productivity. Still in the African region, other studies such as Albiman & Sulong (2016) also examine the role of ICT in economic growth in the Sub Saharan Africa (SSA) region. By using panel data with a period of 27 years (1990-2014) and the GMM method, study of Albiman & Sulong (2016) found that ICT proxied using the internet, fixed telephone lines, found cellphone users to be able to increase economic growth. This is because ICTs increase production efficiency, increase competitiveness, and the ability of public officials to manage institutions more effectively. This condition will increase economic growth.

Most studies for the Asian region also find that the presence of ICT is able to accelerate economic growth. Like a study from Wong (2002) which found that ICT in the form of computers, internet and telephones can increase economic growth. This is because several ICT components accelerate industrial performance in the ASIA region. A study of a country in Asia, namely in Indonesia, was conducted by Zuhdi et al. (2012). Zuhdi et al. (2012) tried to analyze the relationship between ICT and economic growth by comparing cases in Indonesia and Japan. The results show that ICT has a significant positive effect on economic growth for cases in Japan, while for cases in Indonesia it does not. This condition is different because the use of technology is still low in Indonesia. This is actually supported by previous studies, such as Mankiw et al. (1992) using data from 42 developing countries and 24 developed countries with high rates during the 1985-1999 period using Panel Data Modeling, found that the effect of ICT on growth in these countries was meaningful and positive in alleviating countries, positive but not meaningful in developing countries. Even a study from Pradhan et al. (2015) entitled "The dynamics of information and communication technology infrastructure, economic growth, and financial development: Evidence from Asian countries" found that ICT has a

negative impact on economic growth in East Asia, Southeast Asia, West Asia, and Asia as a whole. Only the South Asia region found a positive relationship between ICT and economic growth.

The above results it is found that there is still an empirical gap from the results of studies on the relationship between ICT and economic growth. This is due to the characteristics of economic differences, the level of digital technology and understanding of digital technology. Then most of the objects of study of digital transformation in the form of ICT and economic growth previously focused on countries or regional groups such as the Middle East and North Africa (MENA); Sub-Saharan Africa (SSA), the European Union, and several other regions. Still rarely done in regional or smaller areas. Based on this empirical gap, this study aims to determine the impact of ICT on economic growth in 3 Sumatran provinces namely South Sumatra, Aceh and Lampung.

Then because the aim of this research is to find out the impact of digital transformation as seen from ICT on economic growth, there are other factors that have the potential to influence economic growth. In this case other factors are included in the control variable. One variable that has the potential to influence is investment. Studies from Hepburn & Stern (2019) found that investment has a positive impact on economic growth in China. Investment strengthens capital thereby increasing output. Cobb Douglass' theory of economic growth also includes capital in the form of investment as an important factor driving economic growth. Another factor that is a source of capital is credit. Banu (2013) in his study found that increasing credit was able to encourage economic growth in Romania. This is because credit is one of the capitals which is needed to boost output. In a different direction, inflation becomes an important factor in economic growth. Barro (1995)

explained that inflation will be the basis of how much economic growth there is. This is also proven by a study from Cili & Alkhaliq (2022) which found that inflation reduced Indonesia's economic growth. Inflation reduces aggregate demand and consumption which ultimately leads to a reduction in economic growth.

RESEARCH METHODS

Research Model Specification

This study refers to the model used by Sassi and Goaid (2013) which examines the influence of financial development and information technology on economic growth. The Sassi and Goaid (2013) model can be written as the equation 4.

$$y = f(ICC, FD, TIK, X) \dots\dots\dots(3)$$

From the above economic model, it is derived into the econometric model in this study as follows

$$y_{it} = \beta_0 + \beta_1 IIC_{it} + \beta_2 FD_{it} + \beta_3 ICT_{it} + \beta_4 X_{it} + e_{it} \dots\dots\dots(4)$$

Where y is GDP growth per capita, IIC is initial GDP per capita, FD is financial development, ICT, and X is a control variable consisting of government consumption, inflation, and economic openness. Then the Sassi and Goaid (2013) model was modified and transformed into an econometric model like equation below

$$PDRB_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 Kredit_{it} + \beta_3 Internet_{it} + \beta_4 Inf_{it} + e_{it} \dots\dots\dots(5)$$

Where y is the growth of Gross Regional Domestic Product (GRDP) in the selected Sumatra region. As Barro (1997) has shown that GRDP is included in the model to describe the impact of convergence. INV is an investment, Credit is total credit, Internet describes the level of internet usage, and Inf is inflation. β_0 is a constant. $\beta_{1,2,3,4}$ is a coefficient that will estimate each potential effect of exogenous variables on endogenous variables

described in this study. The difference between this research model and previous studies is the addition of investment variables in the model. This is following the Neoclassical Theory which states that economic growth is influenced by capital and technology (Pyka & Andersen, 2012; Solow, 1956). Credit and inflation variables act as control variables where these two variables are controlled so that the independent variable is not influenced by external factors that are not examined.

Data Sources and Types

This study uses secondary data in the form of panel data from 2018Q1 – 2020Q4 in three Sumatra provinces, namely South Sumatra, Aceh, and Lampung. The research was conducted starting in 2018 because the Indonesian economy managed to overcome economic uncertainty throughout 2018. Therefore, 2018 was used as a turning point for Indonesia's economic improvement and became the basis for determining the time of the study. Sumatra Island is an area with high economic growth after Java Island. However, there are several provinces on the island of Sumatra that have technology development in the low category. Based on the ICT Development Index (IP-TIK) in 2019, it is known that the Provinces of South Sumatra, Aceh, and Lampung are provinces with low IP-TIK categories, namely 4.90 respectively; 4.89; and 4.82 (BPS, 2020). The data used is related to the value of Gross Regional Domestic Product (GRDP), investment, inflation, credit, and internet usage. The data was obtained from the official website of Bank Indonesia and the Central Statistics Agency (BPS).

Analysis Method

The formulation of the problem in this study was solved using the Vector Autoregression (VAR) method. VAR estimation considers all variables as endogenous variables and this method is used to determine the behavior of each independent variable in influencing the depen-

dent variable both in the long and short term (Wardhono et al., 2015). Before VAR estimation, the data were analyzed descriptively to identify the characteristics of each sample to produce a conclusion (Thompson, 2009). The VAR stages include stationarity testing, determining the optimum lag, impulse response function, and variance decomposition.

RESULT AND DISCUSSION

Estimation Results of Digital Transformation in Accelerating Economic Recovery in South Sumatra, Aceh and Lampung

PVAR Analysis of Digital Transformation in Accelerating Economic Recovery in Selected Sumatra Regions. There are several important tests in PVAR estimation, including stationarity test, cointegration test, optimum lag test, and Impulse Response Function (IRF). The data stationarity test in this study uses the Levin, Liu & Chu t^* test. The test data is said to be stationary if the probability value is below the value of (α). The stationarity test aims to obtain a stable average value and the random error is equal to zero so that the estimation results are spurious regression. The stationarity test of the data in this study used the Levin, Liu & Chu t^* test. The results of the statistical test of the data are shown in [Table 1](#).

The results of the data stationarity test using the Levin, Liu & Chu t^* test at the level show that the GRDP, Investment, and Internet variables are not stationary because the probability values are above alpha 1%, 5%, and 10%. Meanwhile, the inflation and credit variables are stated to be stationary at this level. Because not all variables are stationary at the level, the stationarity test is continued at the first different level. On the results of the Levin, Liu & Chu t^* test at the first different level, it shows that only the investment variable is not stationary. While the test is at the second difference level, it is known that all variables are stationary.

Table 1. Unit Root Test Results Using Levin, Liu & Chu T* Test

Variable		Level	1st <i>Difference</i>	2nd <i>Difference</i>
PDRB	Statistic	1.37709	-2.75660	-3.65061
	(Prob)	(0.9158)	(0.0029)***	(0.0001) ***
INV	Statistic	-.34722	-1.00512	-2.74693
	(Prob)	(0.3642)	(0.1574)	(0.0030) ***
INF	Statistic	-3.65849	-3.87085	-6.31889
	(Prob)	(0.0001) ***	(0.0001)***	(0.0000) ***
KREDIT	Statistic	-2.11797	-1.66116	-3.99374
	(Prob)	(0.0171)**	(0.0483)**	(0.0000) ***
INTERNET	Statistic	-1.97098	-1.56739	-3.98374
	(Prob)	(0.9756)	(0.0585)*	(0.0000) ***

Note: ***significant 1%, 5% and 10%

Source: Secondary Data (Processed)

The next test is cointegration. cointegration testing was conducted to determine the long-term relationship between the variables formed in this study. Cointegration testing is carried out using the Pedroni Residual Cointegration Test method. The results of the cointegration test in this study are presented in [Table 2](#).

The results of the Residual Cointegration Test Pedroni show that there is no long-term relationship between variables. The probability of Panel v-Statistic, Panel rho-Statistic value is greater than alpha

5%. Therefore, the data analysis tool used in this study is the Autoregressive Panel (PVAR).

The optimum lag test is used to determine the period of the influence of a variable on other variables which will give optimal results. This is because changes in the movement of a variable are not directly responded to by changes in other variables, but there is still a certain grace period. The test results of the optimum lag are shown in [Table 3](#).

Table 2. Result of Pedroni Residual Cointegration Test

Method	Statistic	Probability	Explanation
Panel v-Statistic	-0.947315	0.8283	Not Cointegrated
Panel rho-Statistic	1.553370	0.9398	Not Cointegrated

Note: Cointegrated alpha 5%

Source: Secondary Data (Processed)

Table 3. Optimum Lag Test Results in Sumatra

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-794.9622	NA	9.98e+16	53.33081	53.56434	53.40552
1	-614.8869	288.1204	3.32e+12	42.99246	44.39366*	43.44072
2	-577.2175	47.71468*	1.66e+12*	42.14783*	44.71669	42.96963*

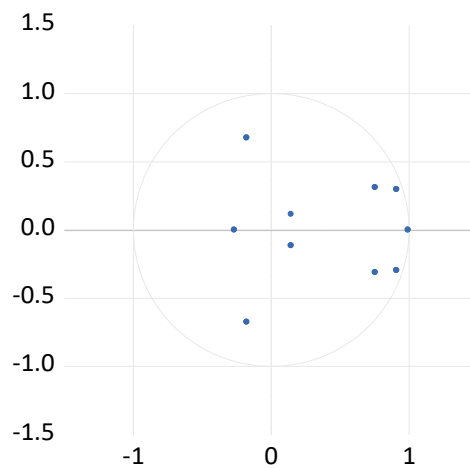
Source: Secondary Data (Processed)

The optimum lag test used in this study is seen from the minimum AIC value. From the results of the optimum lag test described in Table 4 above, it shows that the optimum lag is at lag 1 with an AIC value of 42.14783.

The next test is the stability of the model presented in [Figure 2](#). From the picture, it can be seen that the VAR Panel model used in this study is stable. This is not only seen from the distribution of the data in the circle, it can also be seen that the modulus value of the model used is

below the value of 1. The next step in estimating the PVAR model is the impulse response function (IRF) test. IRF estimation is used to see how shocks from endogenous variables affect other endogenous variables. In this study, IRF will explain the interrelated effects of the variables of GRDP, investment, inflation, credit, and the internet. The results of the IRF test in this study are shown in [Figure 3](#).

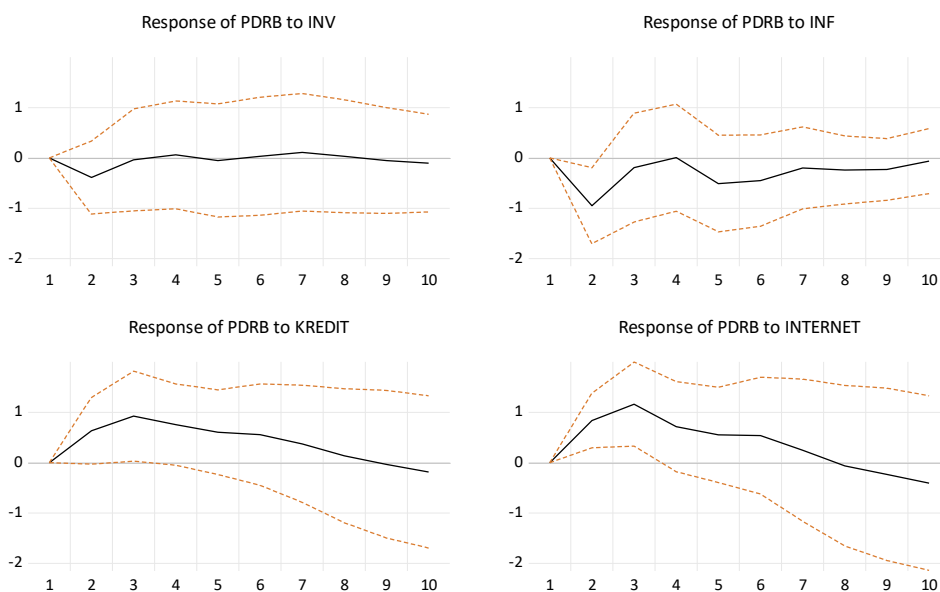
Inverse Roots of AR Characteristic Polynomial



Source: Secondary Data (processed)

Figure 2. Model Stability

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.



Source: Secondary Data (processed)

Figure 3. Impulse Response Function

In [Figure 3](#), it can be seen how the shock that occurred in Investment and the Internet was responded to by economic growth in three provinces of Sumatra, namely South Sumatra, Aceh and Lampung as proxied by GRDP. The results of the IRF in [Figure 3](#) show that the shock that occurred in investment was responded to negatively by GRDP. This shows that investment entering the Sumatra region has a negative impact on its GRDP. From [Figure 3](#), it can also be seen that the negative response is getting bigger in period 2. This means that in period 2 a policy is needed so that investment is directed towards its use to improve the economy. These results indicate that investment entering Sumatra needs to be directed to productive sectors to boost the economy.

Furthermore, the IRF results in [Figure 3](#) also show that improving the quality and use of the internet has a positive impact on economic growth in three provinces of Sumatra, namely South Sumatra, Aceh and Lampung. The impact began to be felt from the first period. The greatest impact given by the internet in encouraging economic growth was the greatest in period 3. This explains that this period is a constant momentum in utilizing the internet and making policies by the authorities so that the impact will be even

greater. Overall, this explains that internet improvements are driving digital transformation to support economic recovery in the Sumatra region.

Estimation of Variance Decomposition (VD) is used to see the proportion of shock contribution to a variable that affects other variables. In other words, Variance Decomposition (VD) is used to find out how much the predictive variance of one variable affects other variables or innovation variables. Where the VD test results are shown in [Table 4](#).

[Table 4](#) shows the estimation results of Variance Decomposition (VD). For 10 time horizons, it can be seen that the internet is an important variable in supporting economic growth in three provinces of Sumatra, namely South Sumatra, Aceh and Lampung. In period 5, the internet contributed 25.25% to forming GRDP. The amount of this contribution lasts for a period of 10. This explains that economic growth in three provinces of Sumatra, namely South Sumatra, Aceh and Lampung is shaped by the internet. This condition can certainly be a special consideration, regarding how important digital transformation is in encouraging economic growth in three provinces of Sumatra, namely South Sumatra, Aceh and Lampung.

Table 4. Result of Variance Decomposition

Period	S.E.	PDRB	INV	INF	CREDIT	INTERNET
1	1.377370	100.0000	0.000000	0.000000	0.000000	0.000000
2	2.262832	57.96751	2.943495	17.55480	7.852305	13.68188
3	2.767658	42.54787	1.984928	12.20498	16.43101	26.83121
4	3.091397	42.55069	1.630967	9.783090	19.17250	26.86276
5	3.372485	43.55131	1.392108	10.47750	19.32037	25.25871
6	3.534306	42.16918	1.277641	11.15717	20.07575	25.32026
7	3.590134	41.99053	1.337610	11.11237	20.54145	25.01805
8	3.611052	42.04083	1.330887	11.42164	20.44980	24.75684
9	3.626091	41.69303	1.338474	11.72358	20.28788	24.95703
10	3.663189	41.30146	1.387573	11.51598	20.12924	25.66576

Cholesky Ordering: PDRB INV INF CREDIT INTERNET

Source: Secondary Data (processed)

Discussion of Digital Transformation in Accelerating Economic Recovery in Selected Sumatra Regions

The Sumatra region managed to rank second after Java in terms of internet penetration in Indonesia in 2019 – 2020 (Q2). Sumatra Island especially three provinces of Sumatra, namely South Sumatra, Aceh and Lampung experienced an increase in internet penetration by 22.1% (2019) from 21.6% (2018) (APJII, 2020). Therefore, that three provinces of Sumatra has a major contribution to the formation of Gross Domestic Product (GDP). Data on investment, inflation, credit and internet usage in three provinces on the island of Sumatra have good data distribution, but the GRDP variable is found to have an uneven distribution of data. This is because in 2020 the economy in the three provinces experienced instability due to the Covid-19 pandemic. Suryahadi et al. (2020) said that Covid-19 was able to affect economic growth and encourage an increase in poverty.

Based on the results of the IRF estimation, it is known that the shock that occurred in investment was responded to negatively by GRDP in the second period. However, in the next period, it showed a positive trend. This illustrates that when a shock occurs, investment requires an adjustment (lag) to GRDP. These results are following the study conducted by Belloumi & Alshehry (2018); Saleem &

Zaheer (2018) which states that domestic investment has a negative relationship with economic growth in Saudi Arabia and Pakistan. This condition is a special concern for the governments of Saudi Arabia and Pakistan to focus more on handling investment. In line with the provincial governments of South Sumatra, Aceh, and Lampung, which are trying to formulate policies related to investment to encourage the level of GRDP. Governments in South Sumatra, Aceh, and Lampung are still trying to encourage investment, even though investment has a fairly low contribution to the increase in GRDP (Table 5). The investment contribution to GRDP is 1.3 – 3% as seen in the variance decomposition results. The level of investment in the selected Sumatra region can be achieved by optimizing each policy that has been set in each province. This process can later create a positive relationship between investment and GRDP, as found by Iqbal et al. (2015), Abubakar & Bala (2016), and Bakari (2017). These results also indicate that the government needs to create a good climate for both the political economy and the environment in order to attract investors. more than that, it is necessary to map investments that are directed to the productive sector so as to create a greater return on investment

Table 5. Selected policies in three provinces of Sumatra regarding investment

South Sumatra	Aceh	Lampung
<ul style="list-style-type: none"> Realizing Special Economic Zone (KEK) Tanjung Api-Api Making regional regulations (perda) and governor regulations (pergub) Mapping investment opportunities 	<ul style="list-style-type: none"> Issued PP No. 5 of 2017 concerning the Special Economic Zone of Arun Lhokseumawe Infrastructure development, such as the Banda Aceh – Medan toll road 	<ul style="list-style-type: none"> Improve the business licensing index and strengthen policy credibility Improve investor's positive perception Increase openness and ease of access to information Improve and improve the quality of investment support facilities

When there was a shock on the internet, GRDP responded positively in the eighth period. Then the respondents were negative during periods nine and ten. This illustrates that the application of the internet after several periods needs to be updated so that when a prolonged internet shock occurs, GRDP will still respond positively to the shock. Efforts made by each province to achieve economic recovery based on technology utilization include South Sumatra creating village internet programs and village websites. Then Lampung Province carried out a smart village program to increase internet literacy and digitization (Shalihin & Safuan, 2021). The internet literacy program is also carried out in Aceh Province by installing the internet for 1,000 mosques and 1,000 Islamic boarding schools. This program can be used by the public to access the internet to increase internet literacy in Aceh Province. The implementation of the internet literacy program can be carried out on an ongoing basis and evaluated periodically so that the selected regions of Sumatra can carry out digital transformation for economic recovery (Ekananda & Suryanto, 2021; Wardhono et al., 2016). This program can be successful with the record that it needs monitoring from the government related to the implementation of financial literacy programs, one of which is for Islamic boarding school students like in Aceh. Sufficient understanding for Islamic boarding school students in Aceh will create positive spillovers in the form of sharing experiences with the surrounding community. As a result, a good understanding related to digital literacy, one of which is the internet, will create its own opportunities to be used as an economic resource such as business opportunities or other innovations. Finally, inclusive economic growth can be achieved.

Then one of the challenges of using digital transformation in the form of internet access is the infrastructure. the challenge is on the stability and strength of

the signal. not only the quantity or distribution of internet distribution, but the infrastructure in the form of stability and signal strength as well as security also needs to be improved. Therefore, in addition to providing digital literacy programs in the form of internet understanding, the basic internet infrastructure also needs to be improved. This is because digital understanding, when combined with adequate infrastructure, will provide efficiency in its use. One of them is to support economic activity. Thus, government and community collaboration is important in utilizing the digital economy in driving economic growth in the Sumatra Region, such as South Sumatra, Aceh and Lampung.

The results also show that when inflation experiences shocks, GRDP responds negatively. When there is a continuous increase in prices, people will reduce the level of consumption of goods or services. This certainly affects GRDP because consumption is a component of GRDP. Therefore, the government needs to form a special unit in controlling inflation such as the inflation control team. This can be done with the task of market operations on basic goods as a source of inflation. Tight inflation mitigation is important in maintaining low and stable inflation so that it can be a support in accelerating the economy.

Then, in contrast to inflation, the results show that when a credit shock occurs in several areas in Sumatra, namely in South Sumatra, Lampung, and Aceh, GRDP will receive a positive response. Public credit is allocated through various channels, both investment and consumption (Qori'ah et al., 2016; Wardhono et al., 2019). Credit in South Sumatra, Lampung and Aceh is a catalyst for economic growth because it increases capital, especially credit used for investment. This will be a big contribution to economic growth if it is allocated to productive sources. Such as the plantation sector and the agricultural industry which are one of the sectors that contribute

greatly to economic growth in South Sumatra, Lampung, and Aceh. Then consumption credit is also a driver of economic growth there because it will increase economic activity. It can also be traced that consumption is a component of economic growth. Thus, it needs to be supported by a low and stable interest rate policy to encourage lending in the South Sumatra, Lampung and Aceh Regions.

CONCLUSIONS AND RECOMMENDATION

Digital transformation is an important strategy to support economic growth. The benefits created are believed to be able to provide momentum in efforts to achieve sustainable development. Overall, the results of this study also confirm how digital transformation creates opportunities and is used to drive economic growth in the three provinces of Sumatra, namely the provinces of South Sumatra, Aceh and Lampung. The convenience provided creates efficiency in the use of economic resources in achieving higher economic growth. In addition, this study also found that macroeconomic indicators such as investment play an important role in driving economic growth in the provinces of South Sumatra, Aceh and Lampung. Greater access to capital accelerates the growth of economic sectors and further stimulates economic growth.

The results of this study provide policy implications. First, the government needs to provide an internet literacy improvement program that can be carried out continuously and evaluated periodically. This is done to maintain the consistency of the economic recovery program in the provinces of South Sumatra, Aceh and Lampung through digital transformation. Second, creating a good investment climate to contribute to increasing GRDP levels. Third, there is a need for proper policy synchronization between the regional government and the central government so that internet development and investment can be utilized optimally to

maximize the sustainable impact on the economic growth of South Sumatra, Aceh and Lampung.

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