

An Analysis of Finance and Banking Development to Indonesia Economic Growth (Monthly Production Index): VECM

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ABSTRACT

Sustainability of finance growth is supported by a good finance system. Finance innovation eases user with more efficient service. Referring to some economic literatures, it has been found that there are different perspectives between the relationships of finance development and economic growth. In responding to those phenomena, this research aims to investigate the influence of the total credit from conventional banks, the total credit of micro small dan medium enterprises, the amount of debit or ATM transaction and the amount of electronic transaction to the Indonesia electronic growth either in a short term or in a long term. The data that is used in this research are monthly time series from January 2015 to March 2022 by using sample from 87 months. The used method is qualitative descriptive by using Vector Error Correction Model and the result shows that in a long term, total credit from conventional bank has a significant impact for the economic growth, while the transaction amount through ATM/debit tends to have negative impact for the economic growth. Independent variables are significant and able to explain the dependent variables as much as 68% and the remaining 32% are influenced by other variables that are not used in this research.

Keywords: finance, monthly production index, economic growth, and VECM

INTRODUCTION

The finance system, which works properly, is considered as one of the main foundations for sustainably economic development (Kunt in Bist, 2018). Referring to some economic literatures, it has been found that there are different perspectives between the relationships of finance development and economic growth. The first perspective comes from Scumperter who argued that a finance development is substantial for an economic development (Bist, 2018). The results from similar research were also showed by other researchers nowadays (Durusu-ciftci et al., 2016), such as them in Australia, Canada, Denmark, Germany, Malaysia, Portugal, and Thailand. Apparently, there is long term cointegration between a finance development

and an economic growth in low-income countries. The development of finance is proxied by credit into private sectors which have some positive impacts and significant for the economic growth (Bist, 2018). A finance system development can be defined as the development of measurement, efficiency, market stability that align with the increase of access to the finance market that can give double benefit for economy. For instance, a good growing finance market will be able to distribute economic saving for beneficial investment (Stiglitz et al dalam Guru, 2019: 3), to reduce information cost in order to gain a better capital allocation (Greenwood et al dalam Guru, 2019: 3) and to reduce the management company cost (Bencivenga dalam Guru, 2019: 3). Moreover, a sophisticated financial intermediary is able to improve the technology innovation by giving some achievements for businessmen (King et al dalam Guru, 2019: 3). A research conducted by Guru et al (2019) in BRICS, Ibrahim & Alagidede (2018) in 29 Africa sub saharan countries and Olilingo et al (2020) in Indonesia.

The second perspective comes from a neo classic group that believes that finance is not the only element of economic growth (Lucas dalam Bist, 2018). It was proved by the research results that were conducted by Chow et al., (2017) in all provinces in China and Kerimov, (2021) in Ukraine. The result showed that credit brings negative impacts for economic growth.

The perception of the traditional economy about innovation growth is finance innovation can boost the product quality and finance (McGuire dalam Qamruzzamanand & Jianguo, 2017: 5). Beside that, finance department efficiency will affect the development of finance through a better payment mechanism which will be able to stimulate national and international trade (Sabandi dalam Qamruzzamanand & Jianguo, 2017: 5). Innovation, in this context, does not only consider the creation of a new thing, but it also includes some enhancement for economic issues in a long term period (Kotsemir in Qamruzzamanand & Jianguo, 2017: 5). Schumpeter (1912) demonstrate that innovation can happen in a new form of product, process, market, raw material, distribution method, or even organization structure. That finance system development then becomes a key to carry out finance efficiency with economic growth (Qamruzzamanand & Jianguo, 2017: 5). Besides accelerating the process of finance development, an innovation in finance sector can support the capital accumulation as well. By the end, this innovation will determine sustainable economic growth, either in the short term or in the long term. In contrast with that belief, another research results showed that there is a negative relation between the electronic transaction and the economic growth such as stated in the research of Suresha et al (2019) in India and Wulandari et al (2020) in Indonesia. After all, starting from those beliefs, this research focuses on the investigation of the credit access influence given by conventional banks and the electronic payment system to Indonesia economic growth.

Economic development in a country can be seen from its economic growth. An economic growth is a benchmark for a country to see whether the government policy was reached or not (Wulandari et al., 2020). It is obvious that the main priority for the growth, such as physical accumulation and human resources, technology development and innovative projects, need an efficient finance intermediation that can be developed well. (Škare & Sinković, 2019).

In a decade, in Indonesia, some varied finance systems have been launched, mainly in banking sectors, such as the launching of the different payment products by using card, mobile banking,

a particular payment option to promote entrepreneurship, internet banking, agent banking and the form of non-bank finance institutions to support institution credit for investment.

Innovation in the finance sector does not only accelerate the process of finance development, it also helps capital accumulation. A technology innovation, which is by the end, will be directed to the sustainability of economic growth either in the short term or in the long term. (Chou et al dalam (Qamruzzamanand, 2017: 2)

The needs of electronic payments from the society which can be expected for its preciseness, its speed, and its safety for every transaction and technology development will lead to the creation of electronic payment. From its history, payment tools have experienced some development in its forms. Started from the metal shape, paper conventional money, to digital currency (Adiyanti dalam Achir & Kusumaningrum, 2021).

THEORETICAL FOUNDATION

Relationship between Total Credit in Conventional Banks and The Economic Growth (Monthly Production Index)

The theory of Keynes money supply stated that the amount of money that are circulating in a society is able to be applied in banking. In this case, the offered product in credit is money. Thus, a credit given by a bank is the same as money that is given to the debtor in order to be used for capital to increase the economy. Money that is circulating in society is controlled by the government, central bank, conventional banks, and society itself (Yuda et al dalam Permana & Mulyati, 2021).

Relationship between Total Credit of Micro Small and Medium Enterprises and the Index of Economic Growth (Monthly Production Index)

Schumpeter theory emphasizes the importance of the entrepreneur roles in realizing economic growth. Entrepreneurs are regarded as a group that will continuously create some changes and innovation in economic activity.

Hubungan antara Jumlah Transaksi Debit dengan Pertumbuhan Ekonomi (Indeks Produksi Bulanan)

Technology plays an important role in economic growth as a support. The technology of electronic payment influences economic stability, especially in the financial sector. It also influences economic growth entirely (Kumari dalam Wulandari et al., 2020).

Relationship between Number of Electronic Transactions and Economic Growth (Monthly Production Index)

The electronic payment system is functioned to facilitate the mobility of the flow of funds, with an efficient, fast and secure payment system that will encourage productivity. (Saraswati dalam Mashabi, 2021).

From the description of the existing problems, a hypothesis that can be put forward in this study, namely:

1. It is suspected that there is a positive and significant effect of total commercial bank loans on economic development in January 2015 - March 2022.
2. It is suspected that there is a positive and significant effect of total MSME credit on economic development in January 2015 - March 2022.
3. It is suspected that there is a positive and significant effect of the number of electronic transactions on economic development in January 2015 - March 2022.
4. It is suspected that there is a positive and significant effect of the number of debit transactions on economic development in January 2015 - March 2022.

METHOD, DATA AND ANALYSIS

This study uses secondary data based on time series monthly data from January 2015 - March 2022 obtained from official publications from Bank Indonesia, the Central Statistics Agency (BPS), and literatures related to and supporting this research. There are two variables used in this study, namely the independent variable and the dependent variable. In this study, the independent variables used are total commercial bank credit, total MSME credit, number of ATM/debit transactions, and number of electronic transactions. While the dependent variable in this study is economic growth proxied by the monthly production index. This study uses a descriptive method with a quantitative approach and uses the Vector Error Correction Model analysis tool. The research data is processed with the EvIEWS application with testing steps:

1. Data stationarity testing
2. Testing the Optimal Lag Length
3. VAR Model Stability Testing
4. Cointegration Testing
5. Empirical VAR/VECM Model
6. Impulse Response Function Analysis
7. Variance Decomposition Analysis

Operational Definition

1. Economic Development (Monthly Production Index)

This is percentage data obtained from the Indonesian Central Bureau of Statistics from January 2015 - March 2022. The formula used is:

$$\frac{\text{Current month production}}{\text{Base month production}} \times 100$$

2. Total Commercial Bank Loans

The calculation:

Working Capital Loans + Investment Loans + Consumer

3. Total MSME Loans

This is data on the amount of credit provided by banks to micro, small and medium enterprises within one month. The calculation:

MSME loans = micro business loans + small business loans + medium business loans

4. Number of Electronic Transactions

The calculation:

Electronic Transaction = Card payment + Digital payment.

5. Total Debit/ATM Transactions

This is data in the form of nominal amount of payment transactions with debit cards for one month.

RESULTS AND DISCUSSION

Stationarity Test

Stationarity Test Table

Variables	Probability		
	Level	First Difference Level	Second Difference Level
PE	0.0001	0.0000	0.0000
TKBU	0.5987	0.6202	0.0001
MSME credit	0.9218	0.0000	0.0000
JTD	0.3454	0.0000	0.0001
JTE	0.9965	0.0000	0.0000

In testing the first difference level, the variables used have a probability value smaller than α 5%, so it can be concluded that at the first difference level the variables of economic growth, total commercial bank loans, total MSME loans, the number of ATM/debit transactions and the number of electronic transactions is stationary.

Optimum Lag Test

Optimum Lag Test Table

Lag	LogL	LR	FPE	AIC	SC	HQ
0	281.5375	NA	7.45e-10	-6.828087	-6.680281*	-6.768785
1	329.2799	88.41183	4.26e-10	-7.389627	-6.502794	-7.033818*
2	349.3193	34.63600	4.84e-10	-7.267143	-5.641283	-6.614827
3	380.3482	49.79940*	4.25e-10*	-7.416004*	-5.051116	-6.467180
4	401.2250	30.92870	4.87e-10	-7.314198	-4.210283	-6.068867
5	426.6686	34.55295	5.10e-10	-7.325150	-3.482207	-5.783311

The table shows that the optimal lag length used in this study lies at lag 3. The choice of lag 3 as the optimal lag is because based on the results of evIEWS that the highest number of stars is at lag 3 which is on the LR test statistic, Final Prediction Error (FPE) and Akaike Information Criteria (AIC) criteria.

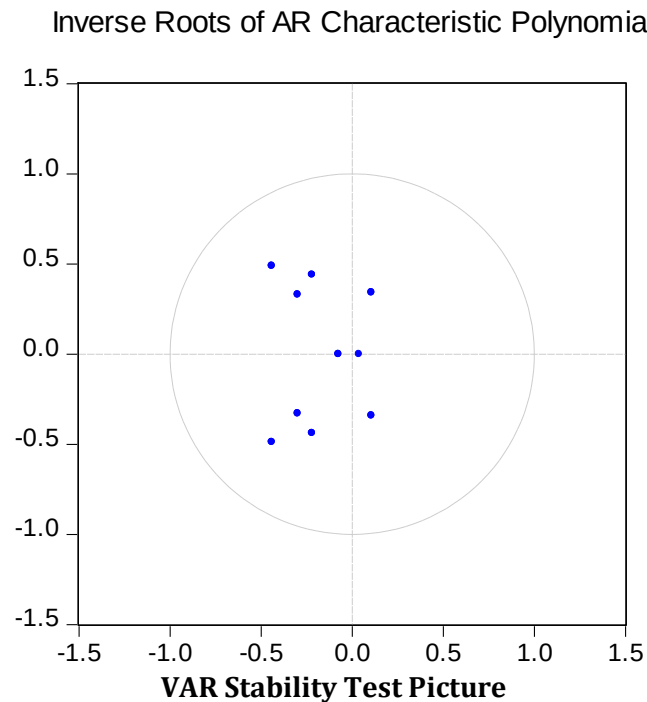
VAR Stability Test

VAR Stability Test Table

Root	Modulus
-0.439788 - 0.489375i	0.657952
-0.439788 + 0.489375i	0.657952
-0.219186 - 0.439730i	0.491329
-0.219186 + 0.439730i	0.491329
-0.297181 - 0.329885i	0.444005
-0.297181 + 0.329885i	0.444005
0.107005 - 0.340944i	0.357341

0.107005 + 0.340944i	0.357341
-0.073675	0.073675
0.039156	0.039156

In the stability test table, it can be seen that the VAR stability test results are stable because the modulus tested has a value of less than one, namely between 0.039156 - 0.657952, so it can be concluded that the VAR model formed is stable at the optimal lag.



From the VAR AR Roots Graph, it can be seen that the points are inside the circle, so the data tested has a modulus value <1 .

Cointegration Test

Cointegration Test Table

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.581705	178.3323	69.81889	0.0000
At most 1 *	0.444328	106.8637	47.85613	0.0000
At most 2 *	0.280676	58.68247	29.79707	0.0000
At most 3 *	0.212872	31.66816	15.49471	0.0001
At most 4 *	0.136562	12.04029	3.841466	0.0005
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The results of data processing show the trace statistic value $>$ critical value 0.05 (5%), there are 5 ranks of variables related to cointegration. The variables used in this study have a long-term relationship with each other, so the VECM estimation in this study can be used.

Causality Relationship Test

Causality Relationship Test Table

Null Hypothesis:	Obs	F-Statistic	Prob.
TKBU does not Granger Cause PE	84	0.53973	0.6565
PE does not Granger Cause TKBU		0.73070	0.5368
MSME credit does not Granger Cause PE	84	1.38075	0.2550
PE does not Granger Cause MSME credit		0.00900	0.3663
JTD does not Granger Cause PE	84	1.20797	0.3126
PE does not Granger Cause JTD		0.07472	0.9734
JTE does not Granger Cause PE	84	3.71271	0.0150
PE does not Granger Cause JTE		1.07472	0.3663
MSME credit does not Granger Cause TKBU	84	1.41812	0.2439
TKBU does not Granger Cause MSME credit		1.46506	0.2307
JTD does not Granger Cause TKBU	84	4.54618	0.0055
TKBU does not Granger Cause JTD		2.23031	0.0914
JTE does not Granger Cause TKBU	84	0.42091	0.7385
TKBU does not Granger Cause JTE		2.79530	0.0458
JTD does not Granger Cause MSME credit	84	1.81824	0.1508
MSME credit does not Granger Cause JTD		1.19574	0.3171
JTE does not Granger Cause MSME credit	84	0.46016	0.7109
MSME credit does not Granger Cause JTE		1.47643	0.2276
JTD does not Granger Cause JTE	84	0.94570	0.4228
JTE does not Granger Cause JTD		2.88981	0.0408

From the results of the causality test, it is known that the number of electronic transactions has unidirectional causality on economic growth with a probability of $0.0150 < 0.05$. Apart from the variable number of electronic transactions, none of them has causality on economic growth.

VECM Test Results

VECM Short-Term Relationship Table

Variables	Coefficient	T-statistic	Description
CointEq1	-1.624990	-4.33206	Significant
D(Economic growth (-1))	0.328240	1.07036	Not Significant
D(Economic growth (-2))	0.194113	0.86997	Not Significant
D(Economic growth (-3))	0.046180	0.36235	Not Significant
D(TKBU (-1))	73.04345	1.13500	Not Significant
D(TKBU (-2))	-77.72941	1.17553	Not Significant
D(TKBU (-3))	-207.9743	-3.02876	Significant
D(MSME Credit (-1))	-5.028707	-0.16135	Not Significant
D(MSME Credit (-2))	-51.60758	-166631	Significant
D(MSME Credit (-3))	13.88583	0.43808	Not Significant
D(JTD (-1))	-59.29141	-4.80489	Significant
D(JTD (-2))	-17.39614	-1.32416	Not Significant
D(JTD (-3))	4.011270	0.35446	Not Significant
D(JTE (-1))	-1.881603	-0.53405	Not Significant
D(JTE (-2))	-2.501220	-0.53405	Not Significant
D(JTE (-3))	1.207243	0.258895	Not Significant

C	2.200608	2.22992	Significant
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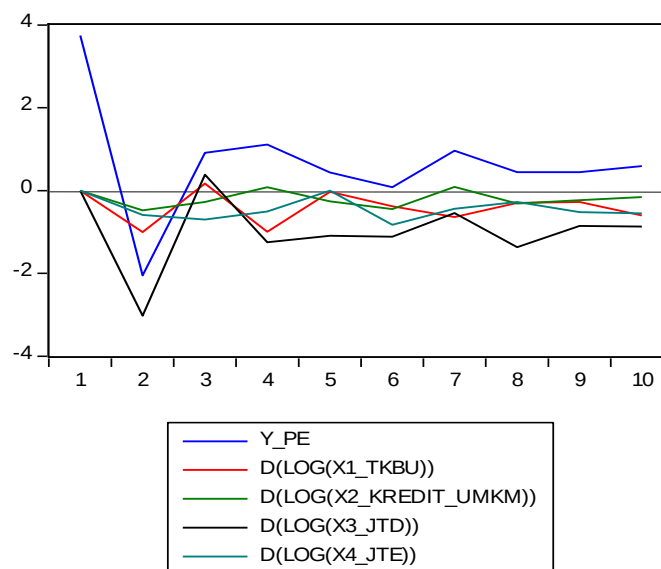
VECM Long-Term Relationship Table

Variables	Coefficient	T-statistic	Description
D(TKBU(-1))	128.4327	4.57158	Significant
D(UMKM CREDIT(-1))	-8.533734	0.41253	Not Significant
D(JTD(-1))	-72.76462	-5.99523	Significant
D(JTE(-1))	-3.419829	-1.58044	Not Significant

From the F test, it can be seen that the independent variables are significant and able to explain the dependent variable by 68%, the remaining 32% is influenced by other variables outside the variables used.

Impulse Response Function (IRF) Analysis

Response of Y_PE to Innovations



IRF analysis of the response shown by economic growth in the event of a shock to total commercial bank credit (TKBU), MSME credit, the number of debit / ATM transactions (JTD) and the number of electronic transactions after 2022 for ten months. The response shown by economic growth in the event of a shock to total commercial bank credit in the first month is negative and tends to fluctuate in negative numbers, only in the third month which is positive. The response shown by economic growth in the event of a shock to total MSME credit starts at a negative number and fluctuates in negative numbers but tends to be more stable. The response shown by economic growth in the event of a shock to the number of ATM/debit transactions in the first month is negative and the decline is quite sharp in the second month. The response shown by economic growth in the event of a shock to the number of electronic transactions is negative but close to 0.

Variance Decomposition (VD) Analysis

Variance Decomposition of Y_PE:						
Period	S.E.	PE	TKBU	MSME Credit	JTD	JTE
1	3.744158	100.0000	0.000000	0.000000	0.000000	0.000000
2	5.380728	62.95616	3.505516	0.793388	31.54503	1.199906
3	5.524992	62.42947	3.420173	1.011807	30.40160	2.736953
4	5.880131	58.69123	5.895803	0.910229	31.34259	3.160153
5	6.002280	56.84407	5.660902	1.061672	33.40040	3.032954
6	6.190105	53.46170	5.707410	1.518138	34.67172	4.641037
7	6.336228	53.31242	6.471305	1.467489	33.82785	4.920944
8	6.518485	50.83066	6.330596	1.625282	36.38543	4.828033
9	6.620201	49.73143	6.312234	1.699506	36.94342	5.313418
10	6.754683	48.53230	6.860241	1.687559	37.14762	5.772280

The Variance Decomposition results after 2022 show that economic growth in the first period is only influenced by the shock of the economic growth variable itself. The variables of total commercial bank credit, total MSME credit, the number of ATM/debit transactions and the number of electronic transactions begin to affect economic growth in month 2 and so on until month 10. From the first month to the tenth month, the proportion of economic growth shock itself is still large. However, economic growth provides a decreasing proportion of shock to economic growth itself from the second month to the tenth month, which is in the range of 62.95-48.53%.

Discussion

Long-Term Relationship between total commercial bank loans, total MSME loans, number of ATM/debit transactions and number of electronic transactions on Economic Growth in Indonesia

Based on the results of the VECM estimation in the long term, it is known that the total commercial bank credit variable has a positive relationship and has a significant effect on economic growth at the α level of 5% with a coefficient of 128.4327. This means that if there is an increase in total commercial bank credit of 1 million rupiah, it will cause an increase in economic growth in the long term by 12.84 percent.

The variable number of ATM/debit transactions has a negative relationship and a significant effect on economic growth at the α level of 5% with a coefficient of -72.76462. This means that if there is an increase in the number of ATM / debit transactions by 1 million rupiah transactions will cause a decrease in economic growth in the long term by 7.28 percent.

The results of this study are different from the results of Mashabi's research (2021). Long-term and short-term estimates of the variable value of debit transactions (DEB) have a positive and significant effect on the economic growth variable (GDP). In accordance with the theory discussed, transactions using non-cash payment instruments can affect the demand for money. Demand for cash is expected to decrease due to the substitutability of using non-cash payment instruments, while M2 has increased due to the increasing amount of money entering the banking system. Transactions with non-cash payments result in a shift in the function of

demand from card money to electronic money, the ease of transactions using non-cash payment instruments (debit cards) will make money circulation faster. In the short term, transactions using non-cash payment instruments in the form of debit cards have a positive effect on economic growth. Similarly, in the long run, the use of debit cards in transactions also has a significant positive effect on GDP.

The results of this study are in line with the results of Oyewole's research, finding that only debit ATMs contribute positively to economic growth, while other electronic payment channels contribute negatively to economic growth (Oyewole et al dalam Mashabi 2021). The digitization of the payment system is still not fully accessed well-literate by all segments of society. There are still people, especially in remote areas, who still have low financial inclusion and literacy (Wardhono et al dalam Qori'ah et al, 2020). The world in 2019 was faced with the 2019 covid pandemic which made restrictions on community activities. The existence of community restrictions reduces the use of debit transactions because many shopping centers are also temporarily closed.

Short-Term Relationship between total commercial bank loans, total MSME loans, number of ATM/debit transactions and number of electronic transactions on Economic Growth in Indonesia

The results of the short-term estimation of the total MSME credit variable show a negative relationship and a significant effect on lag 2, namely -51.60758, which means that if there is an increase in total MSME credit of 1 million rupiah in the current period, it will reduce economic growth by 5.16 percent.

The results are in line with Chow's (2017) study that found bank lending, which is a typical measure of financial development, to be negatively associated with economic growth. This finding may be attributed to the adverse effects of state intervention on China's economy. The variables of education, inflation, and GDP per capita increase the two-way relationship and one-way relationship of finance to economic growth. Meanwhile, in Indonesia, micro and medium enterprises are much more numerous than medium and large enterprises. Micro and small businesses are still not widely touched by bank loans, which affects the results of the study.

The results of the short-term estimation of the variable number of ATM/debit transactions showed a significant negative at lag 1, namely -59.29141, which means that if there is an increase in the number of ATM/debit transactions by 1 million rupiah in the current period, it will reduce economic growth itself by 5.93 percent.

Research conducted by Sreenu et al (2020) The result is that in the long run, there are positive results in using cashless policies on India's economic growth. However, the use of cashless policies on India's economic development in the short term will have a negative impact, while in the long term it will have a positive impact. Therefore, any form of economic strategy that supports cashless payment systems cannot have a direct positive impact on economic development in India. Meanwhile, the results of this study show different results from previous studies, because in Indonesia itself the use of ATMs / debits was only promoted during the 2019 covid pandemic and there were restrictions on community activities.

CONCLUSIONS AND SUGGESTIONS

Conclusion

The conclusions that the author can draw from the results of research on financial development on Indonesia's Economic Growth are as follows:

1. Short-term estimation results Total MSME credit shows a negative relationship and has a significant effect on lag 2, namely -51.60758, which means that if there is an increase in total MSME credit of 1 million rupiah in the current period, it will reduce economic growth by 5.16 percent. The number of ATM/debit transactions shows a significant negative at lag 1, amounting to -59.29141, which means that if there is an increase in the number of ATM/debit transactions by 1 million rupiah in the current period, it will reduce economic growth itself by 5.93 percent.
2. In the long run, total commercial bank credit has a positive relationship and a significant effect on economic growth at the α level of 5% with a coefficient of 128.4327. This means that if there is an increase in total commercial bank credit by 1 million rupiah, it will cause an increase in economic growth in the long term by 12.84 percent. The number of ATM/debit transactions has a negative relationship and a significant effect on economic growth at the α level of 5% with a coefficient of -72.76462. This means that if there is an increase in the number of ATM/debit transactions by 1 million rupiah transactions will cause a decrease in economic growth in the long term by 7.28 percent.

Suggestions that the author can give:

1. Variables that affect economic growth can be of concern to the government. For example, the use of ATMs/debits in the short term and long term has a negative and significant effect on economic growth. The government can implement promotions, service improvements and invite people to save with the existence of ATMs / debits that can increase the use of ATMs / debits in the long run and provide added value to the economy.
2. Banks that channel loan funds to the community can be more selective in providing financing and not only focus on micro and medium enterprises. Banks also need to pay more attention and reach out to small businesses.

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