

Original Article

The Effectiveness of Fintech Lending on Economic Growth and Inequality in Indonesia

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Abstract: In order to support the ease of financial services, Financial technology or fintech must also increasingly innovate. Fintech lending can be a solution to an individual's financial problems. Developing countries often face economic challenges, including problems such as slowing economic growth and high inequality. This research uses a quantitative approach using the Simultaneous model. In this study, the data used is periodic / time series data, namely data from January 2020 to December 2022. This research uses data sourced from OJK, BPS and CEIC. This study has results that show Inflation and lender accounts simultaneously affect GDP, while loans and the Gini ratio have no effect on GDP. Also, the level of outstanding loans simultaneously affects the gini ratio, while outstanding loans and pdb do not significantly affect the gini ratio.

Keywords: Economic Growth, Fintech Lending, and Inequality.

I. INTRODUCTION

Economic growth is one of the indicators that can support economic development (Todaro & Smith, 2020). Economic development can be interpreted as a combination of population and technological progress (Adam Smith dalam (Suryana, 2000) it is seen from the large number of people scattered in various provinces in Indonesia, spread across various islands, and the many ethnicities, religions and races in Indonesia so that the projected population of Indonesia in mid-2023 is 278,696,200 people (BPS, 2023) The large population in Indonesia is a challenge in itself will come with economic problems.

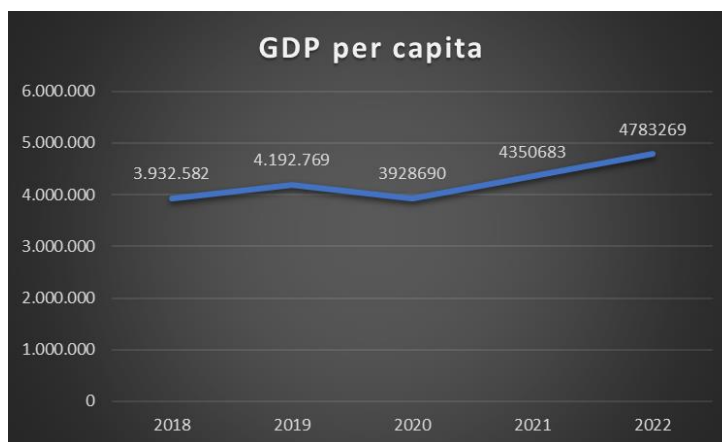


Fig. 1 Graph of GDP per capita from year to year

Source : (CEIC, 2024)

GDP in Indonesia experienced a fairly good increase in 2019, but in 2020, GDP decreased to 3,928,690. The fall in economic growth rates was caused by the COVID-19 pandemic that entered Indonesia in 2020. This is in accordance with the results of research (Arianto, 2020) which says that the COVID-19 virus is able to make economies around the world contract. The positive impact of the COVID-19 pandemic crisis is the acceleration in digital transformation in various fields of life, including the financial services sector (Nasution, Rangkuty, & Faried, 2022). In order to support the ease of financial services, Financial technology or fintech must also increasingly innovate. The National Digital Research Centre in Dublin, Ireland, defines financial technology or fintech as "innovation in financial services". Fintech Lending, also known as Peer-to-Peer Lending, is the process of using financial services to connect lenders and borrowers in lending transactions involving real money in an efficient, fast, and secure manner using an electronic platform (Otoritas Jasa Keuangan, 2016).



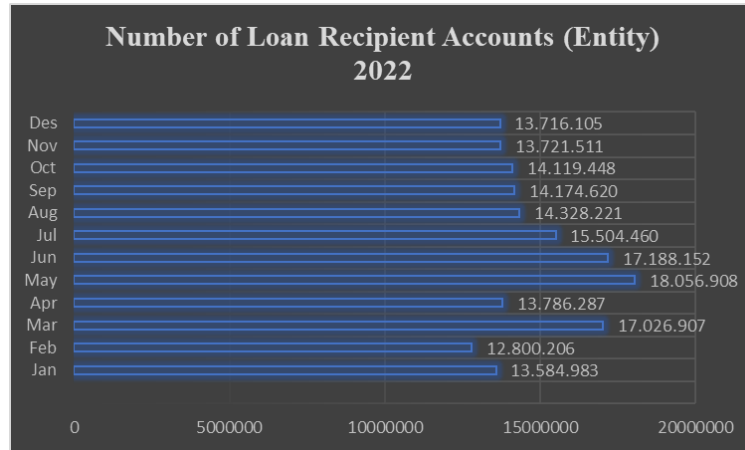


Fig. 2. Data on the Number of Loan Recipients in 2022

Source : (OJK, 2024)

From the data above, we can see the number of recipients of fintech lending loans in 2022. In February, the number of loan recipients decreased the number of borrowers from the previous month with a difference of 784,747 people. However, in March, there was a significant increase, much greater than the previous month, namely 17,026,907 borrowers. This was due to the increase in inflation in March at 0.66 percent and the Islamic religious activities of Eid.

Indonesia also faces the problem of inequality as a developing country. Income inequality refers to the disparity in economic wealth between individuals or groups in the rich and poor categories, which is reflected in the variation in income that exists between them. Inequality itself occurs between the number of high-income earners and the number of low-income earners, as well as the poverty rate and the number of people below the poverty line (Tambunan, 2001). The Gini Ratio is one of the expenditure inequalities used (Badan Pusat Statistik, 2023).

Table 1 : Semester Gini Ratio Data

TAHUN	GINI RATIO
2018S1	0.389
2018S2	0.384
2019S1	0.382
2019S2	0.380
2020S1	0.381
2020S2	0.385
2021S1	0.384
2021S2	0.381
2022S1	0.384
2022S2	0.381

Source : (Badan Pusat Statistik, 2023)

From the table above, the Gini ratio almost touches 1, indicating high inequality that is correlated with economic growth. Economic growth that continues to increase turns out to make inequality in a region also increase, and vice versa (Todaro & Stephen, 2003). Seeing the Theory Gap presented by Todaro and Stephen became the basis for researchers to conduct this research.

II. LITERATURE REVIEW

A) Financial Development

(Levine, 1997) describes financial development as the growth of financial contracts, markets, and brokerage activities, which aim to increase the availability of information and reduce transaction costs. It is expected to facilitate access to information, risk spreading, changes in liquidity, and financial transactions. (Huang, 2006) also added that financial development is a means to improve the efficiency of financial markets as a resource, as well as increase the overall benefits of the financial system. It is considered a key element in accelerating economic growth and overall prosperity.

B) Financial Technology (Fintech)

Fintech can be defined as a business field that focuses on providing financial services using modern software and technology (Fintech Weekly, 2017). More broadly, financial technology is defined as a form of technological innovation in the financial world that can create various business models, applications, processes, or products related to finance (FBS, 2017).

C) Economic Growth

a. Theories of David Ricardo and Thomas Robert Malthus

David Ricardo stated that a doubling of the population at any one time would lead to an abundance of labor. In the end, Malthus and Ricardo argued that economic growth would be defeated by population growth (Chandra, Hidayat, & Rosmeli, 2017).

b. Theories of Joseph Schumpeter

Joseph Schumpeter argued that economic growth cannot occur without innovation. Schumpeter recognized that innovation brings change and can create waves of economic growth. An increase in economic growth accompanied by a decrease in income distribution inequality is considered a sign of the success of a country's economic development. (Schumpeter, 1912)

Inequality

According to (Sjafrizal, 2017), Differences in inequality in natural resource wealth and demographic conditions between regions cause inequality that occur between them, so each region has a different capacity in the development process. According to (Todaro & Stephen, 2003), The conditions or conditions that support economic growth in developing countries are fairer equity. Therefore, the unequal income distribution in a country will have a negative impact on its economic growth.

c. Theories of Kuznet

Kuznet claims that the distribution of income deteriorates during the early phases of economic expansion. But as time goes on, the distribution of income will get better. The theory of income distribution inequality can be traced back to the "inverted U" hypothesis; longitudinal changes (time series) in income distribution can generate Kuznets curves through a continuous growth process related to modern sector changes (Lincoln, 2010)

Gini Ratio

The Gini index is a measure of equity calculated by comparing the area between the Lorenz curve and the diagonal, then dividing by the area of the triangle below the diagonal. Gini index values range from 0 to 1. When the Gini index value is close to 0, it indicates a high degree of equity, while if it is close to 1, it indicates a high degree of inequality (Todaro & Stephen, 2003)

III. METHOD

A) Type and Source of Data

This research applies a quantitative approach method, which has the aim of understanding the level of relationship and patterns of influence between two or more variables (Rusiadi E. , 2023). This research uses the Simultaneous model. The data in this study is time series data, which covers the time span from January 2020 to December 2022. This study uses secondary data obtained from OJK, BPS and CEIC.

B) Data Analysis Method

Simultaneous regression

The study uses the Two-Stage Least Square (TSLS) approach to identify simultaneous equations involving two equations. By using this method, we can determine the level of correlation and influence between variables in the model. Based on this description, the analysis model can be formulated in the form of the following equation:

Model Equation

a. Equation 1 : $PDB = f(INF, RPP, PP, \text{ dan } GR)$

b. Equation 2 : $GR = f(TWP, OP, \text{ dan } PDB)$

The econometric equations for both models are converted into econometric equations, namely :

Econometric Equations:

Equation 1 :

$$\text{LOG(PDB)} = C(10) + C(11) * \text{LOG(INF)} + C(12) * \text{LOG(RPP)} + C(13) * \text{LOG(PP)} + C(14) * \text{LOG(GR)} + e1$$

Means That : Y1: PDB = Pertumbuhan Ekonomi (Economic Growth)

X1: INF = Inflasi (Inflation)
 X2: RPP = Rekening Pemberi Pinjaman (Lender Account)
 X3: PP = Penerima Pinjaman (Loan Recipient)
 Y2: GR7 = Gini Ratio
 a: constanta
 e: error term

Equation 2 :

$$\text{LOG}(\text{GR}) = \text{C}(20) + \text{C}(21) * \text{LOG}(\text{TWP}) + \text{C}(22) * \text{LOG}(\text{OP}) + \text{C}(23) * \text{LOG}(\text{PDB}) + e1$$

Means that :

Y2: GR = Gini Ratio
 X2: TWP = Tingkat Wan Prestasi (Achievement Wan Rate)
 X4: OP = Outstanding Pinjaman (Outstanding Loan)
 Y1: PDB = Produk Domestik Bruto (Gross Domestic Product)
 a : constanta
 e : error term

IV. RESULTS AND DISCUSSION

A) Identification Test

The purpose of identification is to determine whether the equation is in one of three states: under-identified (unidentifiable), precisely identified (correctly identified), or over-identified. The identification condition must meet the criteria of appropriately identified or more to apply the 2SLS method to the system of equations. According to Koutsoyiannis (2007) (Rusiadi, R, & Hidayat, 2014) the 2SLS method meets additional requirements. The Durbin-Watson test indicates that none of the variables are correlated with the error term.

Table 2 : Identification test Equation

No.	Variable Dependent	K-k ... m-1		Hasil	Identifikasi
1.	PDB (Pers. I)	5-2	3-1	3>2	Over Identified
2.	GR (Pers. II)	5-2	2-1	3>1	Over Identified

Source: by researcher

The following formulas are used to determine whether the model is exactly identified or over-identified:

$K-k < m-1$ = means under identification

$K-k = m-1$ = means exact identification

$K-k > m-1$ = means over identification

Means That :

K = Number of predetermined exogenous variables in the model

K = Number of endogenous variables in the equation

m = Number of predetermined exogenous variables in the equation

B) Simultaneous Equation Estimation Results

a. Estimation Result of Economic Growth Equation

Based on the hypothesis that has been carried out, it can be said that Economic Growth is influenced by INF, RPP, PP OP and GR.

Table 3 : Two-Stage Least Square Test Results First Equation

Variabel	Coefficient	Std. Error	t-Statistic	Prob
C(10)	33.21259	13.57566	2.446481	0.0172
C(11)	0.108779	0.040263	2.701715	0.0089
C(12)	0.046676	0.015056	3.100106	0.0029
C(13)	-0.082474	0.085797	-0.961271	0.3401
C(14)	18.04011	12.72843	1.417308	0.1613
R-Squared	0.503682	Mean Dependent Var	15.28303	

Based on the results of the regression show the coefficient of determination (R square) of 0.503682, which means that the variables Inf, RPP, PP and GR are able to explain GDP by 50, 36%, and the remaining 49, 64% of GDP is influenced by other variables outside the estimation in the model.

b. Estimation Results of Gini Ratio Equation**Table 4 : Two-Stage Least Square Test Results Second Equation**

Variabel	Coefficient	Std. Error	t-Statistic	Prob
C(20)	-0.510602	0.255543	-1.998107	0.0500
C(21)	-0.001138	0.000051	-2.066400	0.0429
C(22)	-1.74E-05	0.000165	-0.105763	0.9161
C(23)	-0.029649	0.016579	-1.788324	0.0785
R-Squared	0.140706	Mean Dependent Var		-0.960601

From the estimation results above, it can be concluded that $R^2 = 0.140706$, which indicates that the TWP, OP and GDP variables are able to explain GR by 14.07%, and the remaining 85.93% of GR is caused by other variables outside the estimation in the model.

c. Factors Affecting Economic Growth in Indonesia***The Effect of Inflation on Economic Growth in Indonesia***

From the regression results, it is known that the regression coefficient for INF is positive 0.10, meaning that with every increase in INF by 1 percent, GDP will increase by 0.10 percent. The coefficient value of 0.10 is able to calculate the INF elasticity through the following formula:

$$EINF = \frac{dPDB}{dINF} \times \frac{INF}{PDB} = 0,10 \times \frac{2,6}{4354213,9} = 5,9712 > 1 \text{ Elastis}$$

Based on the regression coefficient results, the positive value is elastic, which means that an increase in INF leads to a greater percentage increase in GDP. This is in accordance with research (Silaban & Rejeki, 2020), which states that, simultaneously, inflation has a positive and significant effect on GDP.

The Effect of Lender Accounts on Economic Growth in Indonesia

Based on the regression results, RPP has a positive regression coefficient of 0.046, which means that every 1% increase in RPP against GDP will result in an increase in GDP by 0.046 percent. This coefficient can be calculated using the following formula:

$$ERPP = \frac{dPDB}{dRPP} \times \frac{RPP}{PDB} = 0,046 \times \frac{5313814,1}{4354213,9} = 0,056 < 1 \text{ inElastis}$$

Based on the regression coefficient results, the positive value is inelastic, which means that an increase in RPP leads to a smaller percentage increase in GDP.

The Effect of Loan Recipients on Economic Growth in Indonesia

Based on the regression results, we can see that the regression coefficient of PP is negative 0.08, which means that every 1% increase in PP will result in a 0.8% decrease in GDP. This coefficient can be calculated using the following formula:

$$EPP = \frac{dPDB}{dPP} \times \frac{PP}{PDB} = -0,08 \times \frac{22663036,2}{4354213,9} = -0,41 < 1 \text{ inElastis}$$

Based on the regression coefficient results, the negative value is inelastic, which means that a smaller percentage decrease in GDP results from each increase in PP.

The Effect of Gini Ratio on Economic Growth in Indonesia

Based on the regression results, we can see that the regression coefficient for GR is positive at 18.04, which means that every 1% increase in GR will result in an 18.04 percent increase in GDP. This coefficient can be calculated using the following formula:

$$EGR = \frac{dPDB}{dGR} \times \frac{GR}{PDB} = 18,04 \times \frac{0,38}{4354213,9} = 1,57 > 1 \text{ Elastis}$$

Based on the regression coefficient results, the positive value is elastic, which means that a larger percentage increase in GDP results from any increase in GR.

d. Factors Affecting Inequality in Indonesia***The Effect of Achievement Wan Rate on Inequality in Indonesia***

Based on the regression results, TWP has a negative regression coefficient of 0.001, which means that every 1% increase in TWP against GDP will result in a decrease of 0.001 percent. This coefficient can be calculated using the following formula:

$$ETWP = \frac{dGR}{dTWP} \times \frac{TWP}{PGR} = -0,01 \times \frac{11,319}{0,3826} = -0,0295 < 1 \text{ inElastis}$$

Based on the regression coefficient results, the negative value is inelastic, which means that a smaller percentage increase in GR results from each increase in TWP.

The Effect of Outstanding Loans on Inequality in Indonesia

Based on the regression results, we can see that the regression coefficient for OP is negative at 1.74, which means that any increase in OP by 1% will cause GR to decrease by 1.74%. This coefficient value can be calculated using the following formula:

$$EOP = \frac{dGR}{dOP} \times \frac{OP}{PGR} = -1,74 \times \frac{4,4619}{0,3826} = -20,291 < 1 \text{ inElastis}$$

Based on the regression coefficient results, the value is negative inElastic, which means that each increase in OP results in a smaller percentage decrease in GR.

The Effect of GDP on Inequality in Indonesia

Based on the regression results, it is known that the regression coefficient for GDP is negative 0.02, meaning that with every increase in GDP by 1 percent, GR will decrease by 0.02 percent. The coefficient value of -0.02 can be calculated as the elasticity of GDP through the following formula:

$$EPDB = \frac{dGR}{dPDB} \times \frac{PDB}{PGR} = -0,02 \times \frac{4354213,9}{0,3826} = -227611,8 < 1 \text{ inElastis}$$

Based on the regression coefficient results, it is known that the negative value is elastic, meaning that each increase in GDP results in a smaller percentage decrease in GR. This is consistent with what was stated (Ayu et al., 2019) that partial economic growth does not affect inequality.

C) Classical Assumption Deviation Test

a. Normality Test

The basic assumptions of the classical linear regression model are that the nuisance factor μ has a mean value equal to zero, is uncorrelated, and has a constant variance. With these assumptions, the OLS estimator or estimators will have desirable properties, such as unbiasedness and minimal variance. To evaluate whether the nuisance factor μ is normally distributed or not, the Jarque-Bera Test (J-B Test) is conducted. This test uses the estimated residuals and the X^2 probability distribution, where the JBcount or X^2 count value is compared to the value listed in the X^2 distribution table.

Table 5 : Normality Test Results

Component	Jarque-Bera	df	Prob
1	0.831625	2	0.6598
2	1.090151	2	0.5798
Joint	1.921776	4	0.7501

In this study, data normality was tested using the Jarque-Bera test. The criterion used is if the probability value of the Jarque-Bera (JB) test $>$ alpha, which is 0.05, then the data is considered normal. From the table, it is known that the probability value is 0.7501 $>$ 0.05, so the normality assumption is met.

b. Autocorrelation Test

Finding out if there is a connection between residuals or errors in a set of data at a specific time is the goal of the autocorrelation test. The presence of autocorrelation can be tested using a variety of techniques. The Durbin-Watson Test approach was applied in this investigation. The Durbin Watson coefficient value, according to Durbin Watson, falls between 0 and 4. It can be said that there is no correlation if the Durbin-Watson coefficient value is close to 2. Positive autocorrelation is indicated by values that are close to 0, and negative autocorrelation is indicated by values that are close to 4.

Table 6. Autocorrelation Test Results

Lags	Q-Stat	Prob	Adj Q-Stat	Prob.	df
1	26.84276	0.0000	27.60970	0.0000	4
2	35.92431	0.0000	37.22545	0.0000	8
3	36.64421	0.0003	38.01079	0.0002	12
4	38.27901	0.0014	39.84995	0.0008	16
5	45.28018	0.0010	47.98034	0.0004	20
6	62.56139	0.0000	68.71779	0.0000	24
7	75.08747	0.0000	84.26741	0.0000	28
8	83.96009	0.0000	95.67506	0.0000	32
9	92.69365	0.0000	107.3198	0.0000	36
10	97.34049	0.0000	113.7539	0.0000	40
11	102.3854	0.0000	121.0186	0.0000	44
12	107.8588	0.0000	129.2287	0.0000	48

*The test is valid only for lags larger than the system lag order.

Df is degrees of freedom for (approximate) chi-square distribution

Based on the results of the prob Q-stat and prob Adj Q-stat values not exceeding 0.05 or 0.10, there is an autocorrelation effect in the data movement; the results of df is degrees of freedom for (approximate) chi-square distribution above show that all indicators of the movement of lags over time do not show any autocorrelation effect in the data movement.

V. CONCLUSION

Based on the research discussion, it can be concluded that inflation has a significant impact on Indonesia's economic growth. This is because inflation is known to have a positive elastic value to Indonesia's economic growth, which means that any increase in inflation will follow an increase in economic growth. In addition, lender accounts have a significant impact on Indonesia's economic growth. This is because lender accounts have a positive inelastic value with Indonesia's economic growth, which means that any increase in lender accounts means that Indonesia's economic growth will also increase.

When viewed from the perspective of loan recipients, the effect on Indonesia's economic growth is very small. The loan recipients has no significant effect on Indonesia's economic growth. The Gini ratio has a positive elastic value, which means that any increase in GR results in a larger percentage increase in GDP.

Outstanding loans are declared insignificant, affecting the gini ratio. Outstanding loans have a negative inelastic value, which means that any increase in outstanding loans will decrease the gini ratio. The default rate is stated to significantly affect the gini ratio. The default rate has a negative inElastic value, which means that any increase in the default rate will decrease the gini ratio. GDP does not significantly affect the gini ratio. This is because GDP has a negative inElastic value, which means that any increase in GDP results in a smaller percentage decrease in the gini ratio.

Advice

Based on the research results and conclusions above, several suggestions are presented, such as increasing the productive sector in loan recipients so that they can support economic growth, likewise with outstanding loans where money that is still in the repayment period must be returned immediately in accordance with the agreement so that there are no loans in arrears. The level of default or delinquent loans must also be suppressed because it can increase inequality.

Some suggestions are addressed to the Otoritas Jasa Keuangan (OJK), such as a more detailed explanation of the number of loan users who use for the productive sector as well as differentiating between individual, corporate or government borrowers.

Interest Conflicts

This research states that there is no conflict with any party.

Funding Statement

Research was conducted using personal funds without interference from any party.

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