

The Effect of Financial Deepening on Economic Growth in Indonesia

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ABSTRACT

Research Originality: This study presents a new interaction between the independent variable financial deepening by adding the inflation control variable as a monetary variable, trade openness and remittances as non-monetary variables, and a dummy variable to see the influence of the pandemic period and not the COVID-19 pandemic period on economic growth.

Research Objectives: This research aims to determine the effect of financial deepening on economic growth in Indonesia.

Research Methods: This research uses quarterly time series data in Indonesia from 2010-2023 and selects an Error Correction Model (ECM) and Robustness Test model.

Empirical Results: Research findings show that financial deepening in the long term and short term has a negative effect on economic growth. This happens because financial deepening in Indonesia is still relatively low, at around 40 percent. The trade openness and remittance variables have a positive effect on economic growth, while the dummy COVID-19 variable in the long term has a negative effect on economic growth.

Implications: This study implies that the government needs to improve effective coordination in facing challenges in the financial sector and set targets to encourage financial deepening so that financial inclusion can be achieved.

Keywords:

economic growth; financial deepening; inflation; trade openness; error correction model (ECM).

How to Cite:

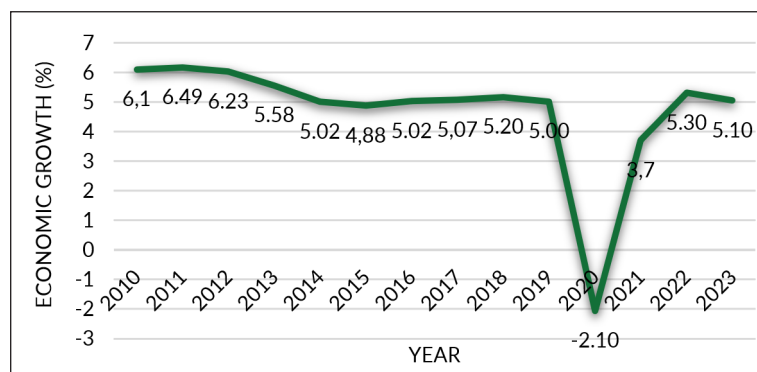
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INTRODUCTION

Economic growth in a country can be seen from increasing gross domestic product supported by financial sector stability. A monetized economy with a well-developed financial system is a prerequisite for growth and development. Miskhin and Eakins (2009) state that the financial sector has an important role by carrying out an intermediary function in stabilizing and advancing the economy. Therefore, the role of financial deepening in driving growth cannot be ignored. Theoretically, the financial system consists of institutions, instruments, and regulators that interact continuously to increase the effectiveness of this sector in maintaining growth and development (Okafor & Lilian, 2022).

In general, economic growth experienced fluctuations from 2010 to 2023, as shown in Figure 1. Indonesia's GDP in 2019 was recorded at 5 percent and experienced a drastic decline in 2020 of -2.10 percent due to the COVID-19 pandemic. This data shows that unexpected factors can influence economic growth, such as the COVID-19 pandemic, which causes economic growth to experience a recession. Economic growth will slowly return to growth in 2021 by 3.70 percent and decline in 2023 by 5.10 percent from the previous year.

Figure 1. Development of Indonesia's Economic Growth 2010-2023



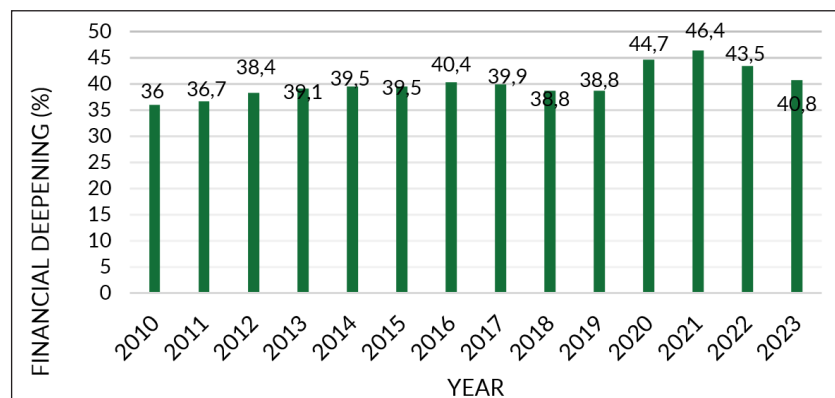
Source: Bank Indonesia (2024)

The relationship between finance and economic growth has been described across economic studies as tending to differ substantially, which may be due to differences in market features, structure, and size (Hondroyiannis et al., 2005). This relationship has two basic theoretical arguments in the literature: the demand-following and supply-leading hypotheses (Chettri, 2022). This hypothesis ultimately leads to financial development and is theoretically and empirically supported by many researchers. A less efficient financial system causes economic growth to be hampered and money circulation to be reduced. The demand-following hypothesis argues that economic growth will create demand for financial services and instruments. This hypothesis ultimately leads to financial development and is theoretically and empirically supported by many researchers (Ang & Mckibbin, 2007; Apergis et al., 2007).

Financial deepening is an increase in volume in an economy's financial sector, which can include the total number of banks, financial instruments, financial organizations, and financial markets (Lei et al., 2022). Financial deepening can increase credit and capital, stimulate entrepreneurial activities, and reduce financing barriers for small and medium businesses in an economy (Beck, 2013a). Important empirical research that establishes the relationship between finance and growth is King and Levine (1993), then expanded by Barro (1991) with a cross-country framework by adding financial variables such as liquidity obligations in the private sector to gross domestic product (Rousseau & Wachtel, 2009).

Figure 2 below explains the development of Indonesia's financial deepening, which is taken from the M2/GDP value. Financial deepening in 2010 amounted to 36 percent and increased until 2016, amounting to 40.4 percent. Financial deepening in 2020 increased again to 44.7 percent and decreased in 2022 by 43.5 percent and 40.8 percent in 2023. Economic transactions, which continue to grow amidst economic recovery after the pandemic, can be a synergy in accelerating economic growth by strengthening the monetary and fiscal policy mix.

Figure 2. Development Financial Deepening Indonesia 2010-2023



Source: World Bank, (2023)

The increasing number of financial instruments and institutions in Indonesia does not mean that all people use these financial services. Shadow banking or irresponsible finance can occur due to financial activities outside official banking institutions. Digital-based financial crimes committed by irresponsible individuals are also widespread, including sending dangerous website links or malware, OTP code fraud, data theft, and other digital-based crimes that can harm society. The COVID-19 pandemic has also become a condition that hampers economic growth because people's purchasing power and income have decreased, and many workers have experienced layoffs.

Trade openness, which is taken from the value of exports minus imports divided by GDP, also has the potential to increase economic growth by providing access to goods and services, achieving resource allocation and efficiency, and increasing productivity through knowledge and technology (Barro & Sala-i-Martin, 1995). Countries with higher trade openness are predicted to perform better than countries with lower trade openness

(Keho, 2017). Trade openness can expand markets and increase income if the export value exceeds the import value.

Remittances or money transfers made by international immigrants to families from their country of origin in the short term allow the recipient family to consume more, generating household economic growth. In the long term, remittances can encourage economic growth if funds are invested (Sanchez, 2022). Remittances from immigrants can also promote the stability of the balance of payments in the country of origin and become a source of state finances.

Making reasonable and appropriate financial policies can increase economic growth over time. Inappropriate economic sector policies cause a mismatch in the volume of loans and those lent. This discrepancy can be subsidy funds, bailouts, or unique behavior between one sector and another. Behavior like this can distort the accumulation process, reducing economic achievements in the long term (Bhattarai, 2015).

In their research, Acedański and Pietrucha (2019) aim to determine the role of the level and dynamics of financial deepening on GDP fluctuations. The test model uses the GMM (Generalized Method of Moments) method and the SAR (Spatial Autocorrelation) model. The research results show that the role of the level of financial deepening consistently has a non-linear relationship. Higher levels of financial deepening are associated with higher volatility when the financial deepening measure exceeds 96–124 percent of GDP. The dynamics of higher financial deepening as measured by private credit can increase GDP volatility in many countries over the last 45 years.

Research conducted by Wasiaturrehma et al. (2019) aims to analyze the impact of financial deepening on economic growth in Indonesia from 1975 to 2016. The test model uses a combination of the ARDL test to determine the long-term effect and the ECM test to determine the short-term effect. The research results show that financial deepening significantly negatively impacts Indonesia's economic growth. The variables of government spending, money supply, and trade openness have a simultaneous influence. However, only the trade openness variable significantly influenced Indonesia's economic growth during the research period.

Putri and Mubin (2021) research aims to analyze the effects of financial deepening, exchange rates, and interest rates on economic growth in Indonesia from 2010 to 2019 using the VECM method. The results show that exchange rates and interest rates negatively interact with economic growth, while financial deepening has a significant negative long-term effect on economic growth.

Researchers such as Acedański and Pietrucha (2019), Wasiaturrehma et al. (2019), and Putri and Mubin (2021) have gaps in their methods, samples, and results. This fact shows that each study is different. Based on the differences in research, this study was carried out by developing several things, such as sample type, period, and methods used. This difference contributes to financial deepening so that gaps in previous research can be supported.

Financial problems that occur can affect economic growth. This condition makes researchers interested in researching the influence of financial deepening on economic

growth in Indonesia. The development of this research uses independent variables in the form of financial deepening with the M2/GDP indicator, as well as adding control variables, namely inflation as a monetary variable, trade openness and remittances as non-monetary variables, as well as dummy variables to see the influence of the pandemic period and not the Covid-19 pandemic period on Indonesia's economic growth from 2010-2023. The author chose quarterly time series data because several previous researchers focused on using annual data in the M2/GDP variable for financial deepening. The research uses control variables in the form of non-monetary variables, such as trade openness and remittances, because most of the empirical studies used in this research only use monetary variables. Based on previous issues and research that have not received much attention regarding financial deepening in Indonesia, the author is interested in conducting this research.

METHODS

This research uses quantitative analysis with secondary data from quarterly and time series data in Indonesia's country from 2010-2023. Research data comes from the websites of Bank Indonesia and Badan Pusat Statistik. The data set includes economic growth as the dependent variable, financial deepening as the independent variable, and control variables are inflation, trade openness, remittances, and dummy COVID-19. Economic growth data uses the economic growth rate in the form of annual percentage changes (year-on-year/yoy). Financial deepening data uses a monetization measure called M2/GDP. Inflation data uses Bank Indonesia's inflation data as percentages based on changes in the Consumer Price Index. Trade openness data uses data on the total value of exports plus imports divided by GDP. Remittance data uses the value of the total remittances of Bank Indonesia in millions of USD, then converts it into rupiah by multiplying the exchange rate against the rupiah. Meanwhile, the dummy COVID-19 data uses the values 0 (not during the pandemic) and 1 (during the pandemic).

This research uses the ECM (Error Correction Model) analysis techniques. ECM is a statistical test tool used to determine the effect of independent variables on dependent variables in the short and long term. ECM data analysis aims to determine whether the time series data has a long-term balance. ECM estimation is carried out after conducting a data stationarity test and a cointegration degree test. Research that uses the ECM method must use variables that are not stationary at the level; then, it can be continued at the degree of integration test stage. The cointegrated test results show that the tested residue is stationary if the residual value is lower than the error rate. After the test is carried out, it is discovered that there is cointegration. The next process is carried out using the error correction method. The ECM estimation model in the long term can be explained in the following model:

$$Y_t = \alpha_{11} + \beta_{12}FD_t + \beta_{13}INF_t + \beta_{14}TO_t + \beta_{15}LnREM_t + e_t \quad (1)$$

Remittance data is converted into natural logarithm form to equate units with other variables. Converting data into logarithmic form is carried out on data with different

units to obtain stationary data. Meanwhile, control variables are used to prevent biased calculation results. Variables with a long-term relationship (cointegration) can be suspected that in the short term, the variables do not have an equilibrium relationship, so in the short term, a model correction needs to be carried out. This can be done by using the residuals obtained from the previous stage so that the variables can return to the process toward long-term balance. The ECM model in the short term can be written with the equation below:

$$Y_t = \alpha_{11} + \beta_{12}\Delta FD_t + \beta_{13} \Delta INF_t + \beta_{14}\Delta TO_t + \beta_{15}\Delta LnREM_t + \beta_{16}ECT_{t-1} + e_t \quad (2)$$

The robustness test used to determine the robustness of the model of a variable. This resilience is analyzed by loading beta (β) data. The robustness test in this research is used to test the independent variable that is added as a dummy to the dependent variable, namely economic growth during the pandemic and not during the pandemic. The long-term estimation model used in this research is as follows:

$$Y_t = \alpha_{12} + \beta_{22}FD_t + \beta_{23} INF_t + \beta_{24}TO_t + \beta_{25}LnREM_t + \beta_{26}Dummy_t + e_t \quad (3)$$

Meanwhile, the short-term model can be shown in the following model:

$$Y_t = \alpha_{12} + \beta_{22}\Delta FD_t + \beta_{23} \Delta INF_t + \beta_{24}\Delta TO_t + \beta_{25}\Delta LnREM_t + \beta_{26}\Delta Dummy_t + ECT_{t-1} + e_t \quad (4)$$

Where: α : Constant; β : Slope of the independent variable; Ln: Natural logarithm; Y_t : Economic growth; FD: Financial deepening; INF: Inflation; TO: Trade Openness; REM: Remittance; Dummy: Dummy Covid-19; e_t : Interference with white noise; Δ : first difference; ECT: Error Correction Term; t: Time period. If the ECT error coefficient value is statistically significant, then the ECM specification model used in testing is valid.

RESULTS AND DISCUSSION

The results of this research are based on data analysis carried out using the ECM test analysis method and the Robustness test. The results show that financial deepening in the long term and short term has a negative effect on economic growth. The inflation variable in the research period did not significantly affect economic growth in the long term and short term. Trade openness has a positive effect, both in the short and long term. In the long term, remittances have a positive effect on economic growth. In the long term, the dummy Covid-19 variable has a negative effect on economic growth. Meanwhile, the robustness test found that the long-term model was stronger than the short-term model.

Descriptive statistics are used to provide a general description of the characteristics of research data without concluding. Descriptive statistics are the initial part of starting data testing. Descriptive statistics in this study are presented in the form of mean, median, maximum data, minimum data, and standard deviation for each variable studied. This research uses real GDP, financial deepening, inflation, trade openness, remittances, and the dummy Covid-19. This research uses data from 2010-2023 in a quarterly format. The following are the results of descriptive statistical tests in Table 1.

Table 1 shows that 56 data points from each variable were used in the research. The dependent variable, economic growth (Y), has a mean value of 4.74 with a standard deviation 2.32. The independent variable financial deepening (FD) has a mean value of 152.70 with a standard deviation 12.24. Financial deepening improves the financial sector by increasing the services and volume of financial instruments and institutions available on the financial market. The inflation variable (INF) has a mean of 4.25 with a standard deviation of 1.88. Since the 1970s, monetary policy has begun to play a significant role in fighting inflation. Stable and on-target inflation is very important to stabilize economic growth. Trade openness uses the indicator exports plus imports divided by GDP. The trade openness (TO) variable has a mean of 43.01 with a standard deviation of 5.49. The increasingly rapid development of globalization has encouraged many countries to carry out international trade, which each country can use to increase economic growth.

Table 1. Descriptive Statistics

Variable	Mean	Median	Maks.	Min.	Std. Dev
Y	4,74	5,10	7,10	-5,30	2,32
FD	152,70	152,25	175,70	127,40	12,24
INF	4,25	3,75	8,40	1,33	1,88
TO	43,01	43,21	53,90	30,48	5,49
LnREM	17,19	17,23	17,85	16,49	0,38
DUMMY	0,23	0,00	1,00	0,00	0,42

Source: Author Computation (2024)

The remittance variable (LnREM) has a mean of 17.19 with a standard deviation of 0.38. Remittances are money transfers made by migrant workers from abroad to their home country. Remittances are one of the foreign exchange contributors to a country's development and contribute to economic growth. Furthermore, the dummy has a mean of 0.23 with a standard deviation of 0.42. A dummy variable is used to quantify a qualitative variable that is thought to have the influence of a variable with continuous properties (Gujarati & Porter, 2009). Dummy variables are used to see whether the pandemic period or not the COVID-19 pandemic period affects the economic growth variable.

Table 2. Root Test Results at Grade Level

Variable	ADF Statistic	Critical Value			p-value	Explanation
		1%	5%	10%		
Y	-2.966	-3.573	-2.926	-2.598	0.6326	Not Stationary
FD	-1.958	-3.573	-2.926	-2.598	0.3055	Not Stationary
INF	-2.266	-3.573	-2.926	-2.598	0.1832	Not Stationary
TO	-2.244	-3.573	-2.926	-2.598	0.1907	Not Stationary
LnREM	-1.059	-3.573	-2.926	-2.598	0.7310	Not Stationary
DUMMY	-	-	-	-	-	-

Source: Author Computation (2024)

The stationarity test is carried out as a first step before testing the ECM model. The stationarity test was carried out on all variables except dummy variables. The stationarity test is used to see that the regression results do not contain spurious regression. The test results shown in Table 2 show that no variables are stationary at grade level because the statistical ADF value is lower than the critical values of 1 percent, 5 percent, and 10 percent. Meanwhile, the value of the p-value analysis results for all variables is more than 0.05, which means the data is not stationary. The stationary test continues at the first difference stage, shown in Table 3 below. The results show that all variables at this stage have statistical ADF values higher than the critical values of 1 percent, 5 percent, and 10 percent, so they are said to be stationary. The p-value in this test is $0.0000 < 0.05$, which means the data is stationary.

Table 3. First Difference Level Root Test Results

Variable	ADF Statistic	Critical Value			p-value	Explanation
		1%	5%	10%		
Y	-8.231	-3.574	-2.927	-2.598	0.0000	Stationary
FD	-8.083	-3.574	-2.927	-2.598	0.0000	Stationary
INF	-8.460	-3.574	-2.927	-2.598	0.0000	Stationary
TO	-9.604	-3.574	-2.927	-2.598	0.0000	Stationary
LnREM	-7.554	-3.574	-2.927	-2.598	0.0000	Stationary
DUMMY	-	-	-	-	-	-

Source: Author Computation (2024)

The cointegration test used in the research uses the Engle-Granger test by creating residuals from the statistical regression results. Test results with cointegrated time show that the tested residue is stationary if the residual value is lower than the 5 percent error rate. Table 4 below shows the results of the cointegration test from the ADF stationarity test at level levels, which shows the statistical ADF value is greater than the critical value and the p-value is smaller than 0.05. These results are stationary, so it can be concluded that there is cointegration or a long-term relationship between variables. So, the ECM model can be continued because cointegration has been fulfilled.

Table 4. Engle-Granger Cointegration Results

Variable	ADF Statistic	Critical Value			p-value	Explanation
		1%	5%	10%		
ECT	-4.361	-3.573	-2.926	-2.598	0.0003	Stationary

Source: Author Computation (2024)

The cointegration test results showed cointegration between variables so that the ECM model could be continued. ECM estimates are used to analyze this research,

provide information, and draw conclusions. This ECM estimate was carried out to test and analyze financial deepening in encouraging economic growth in Indonesia. After carrying out the stationarity and cointegration tests, the long-term and short-term ECM tests are continued. Therefore, the ECM test results are shown in Tables 5 and 6, which will be analyzed in the discussion of the ECM results. An empirical study conducted by Beck (2013) refers to efforts to improve the financial sector by increasing the volume of financial transactions in an economy. Several indicators are used to measure financial deepening. The measure of monetization in measuring financial deepening is following the empirical literature from King and Levine (1993) using M2/GDP.

Table 5. Long Term ECM Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob	Explanation
FD	-0.1103285	0.0260474	-4.24	0.000	Stationary
INF	-0.0813899	0.1530938	-0.53	0.597	Not Stationary
TO	0.2377596	0.0552226	4.31	0.000	Stationary
LnREM	2.452043	0.7865157	3.12	0.003	Stationary
C	-30.44846	12.7304	-2.39	0.020	Stationary

Source: Author Computation (2024)

The ECM model estimation results show that FD has a negative effect on economic growth in the long term and short term. The research results show that the coefficient of the FD variable in the long term is -0.1103285, which means that when FD increases by 1 percent, economic growth will decrease by 0.11 percent. The short-term research results show that the FD coefficient is -0.1146815, which means that when FD increases by 1 percent, economic growth will decrease by 0.11 percent.

Table 6. Short Term ECM Results

Variable	Coefficient	Std. Error	t-Statistic	Prob	Explanation
FD	-0.1146815	0.0386701	-2.97	0.005	Stationary
INF	0.1763119	0.1684143	1.05	0.300	Not Stationary
TO	0.220683	0.0666214	3.31	0.002	Stationary
LnREM	2.773247	1.830713	1.51	0.136	Not Stationary
ECT	-0.5381639	0.1252316	-4.30	0.000	Stationary
C	0.0089672	0.1963076	0.05	0.964	Not Stationary

Source: Author Computation (2024)

Fajeau (2021) analyzed the relationship between finance and economic growth by providing alternative estimates that support the hypothesis that overall financial deepening has more negative impacts than benefits. This study contributes to the literature establishing a negative relationship between finance and growth globally. The relationship

between finance and growth has deteriorated over time. The ongoing liberalization process has caused many countries to experience financial difficulties. An inadequate sequence of reforms may cause these adverse impacts regarding inappropriate supervision and regulation of the financial system.

Bank Indonesia (2009) stated that the M2/GDP ratio in Indonesia is still relatively low because currently, it is only around 40 percent (< 50 percent), which shows that financial deepening is still shallow. Countries in ASEAN, such as Singapore, Malaysia, Thailand, and Cambodia, have deep financial deepening because they have reached 100 percent (World Bank, 2023). The low income of the Indonesian people and the recovery after the COVID-19 pandemic are some of the causes of low levels of consumption of goods and services, which, in the end, can put pressure on national income.

An increase in economic growth causes financial deepening, which shows a downward trend, and vice versa. This fact supports a negative relationship between economic growth and financial deepening because the financial system in Indonesia is still shallow. The financial system is not yet fully capable of encouraging the country's economic growth through a financial deepening strategy (Putri & Mubin, 2021).

According to research results, financial deepening negatively affects economic growth in the short term. These results follow research by Wasiaturrahma et al. (2019), which shows that financial deepening negatively impacts economic growth. The level of monetization can be seen from the amount of people's money in banks, both savings and current accounts. The United States payment technology company, in its 2023 Visa study, released that 80 percent of people still use cash to make transactions.

The importance of financial literacy that needs to be instilled in all levels of society can align with the concept and comprehensive understanding of the technology or financial infrastructure used. Digital crime and shadow banking can also occur on financial technology (fintech) platforms that the OJK does not license. Unofficial economic activities tend to hinder the smooth functioning of the official economy. The impact of the COVID-19 pandemic could also be the cause of a reduction in the amount of money in circulation because many workers were laid off, consumption decreased, investment decreased, and a large amount of funding was spent to handle COVID-19.

Financial deepening has a more substantial negative effect in high-income countries with an impact that may increase growth in the early stages of development. From a policy perspective, stating that financial deepening is not relevant to growth but instead encourages better alignment between the financial system and economic needs, making the financial system more resilient, will reduce the negative impact of financial deepening on economic growth. Policymakers should strengthen credit constraints to limit excessive financial credit expansion (Fajeau, 2021).

The more sustainable and profound the development of the financial sector, the greater the ability to achieve sustainable economic growth, because there are significant and varied sources of investment funding support, even though in 2020, there was an increase in financial deepening, which reached 44.7 percent, it cannot be said that there was an increase in financial deepening. This condition could happen because of the significant increase in M2 in 2020, accompanied by an economy experiencing a decline due to COVID-19.

The economic slowdown due to Covid-19 has also caused a reduction in payment activity. Cash payments experienced a contraction in line with the implementation of large-scale social restrictions, thereby reducing mobility and public demand for cash transactions. This results in a lower volume and value of non-cash payments made with ATMs, debit cards, credit cards, and electronic money. Digital banking experienced a decline in value and volume during the first semester of 2020. Several positive developments emerged during the pandemic, namely increasing public demand for digital platforms and instruments through shopping on e-commerce platforms (Bank Indonesia, 2020).

Inflation is an important indicator and must be kept stable to reduce instability in an economy. Low inflation is a prerequisite for a country to achieve macroeconomic targets, such as providing extensive employment opportunities and increasing economic growth. Choosing a stable level of inflation is the final target in Indonesia's monetary policy, which is based on the reality that a high level of inflation can cause instability and have a negative impact on the economy (Ntirabampa & Iraya, 2019).

The results of inflation show that the results are not significant in influencing economic growth in Indonesia in the long and short term. Most previous literature explains that increasing inflation can hamper economic growth.

The estimation results on the inflation variable show that the results do not significantly influence economic growth in Indonesia. In their research, Razia et al. (2023) show that inflation does not affect economic growth, although inflation ultimately impacts economic growth. This result shows that market price or inflation stabilization is needed through an effective price control mechanism to improve macroeconomic conditions. This strategy can also increase investor confidence and stimulate economic growth so that more output can be produced at lower unit costs, which is expected to achieve sustainability and economic growth. The inflation relationship in the test results during the research period was very weak, but inflation greatly influenced economic growth.

Inflation in recent years has been maintained stable within the inflation target range of 3 ± 1 percent. The government and Bank Indonesia continue to strive to maintain price stability and inflation so that when there is an increase in prices for one or two goods, the government can handle it by strengthening the Control team—central and Regional Inflation and implementing consistent fiscal and monetary policies. The government is also trying to mitigate the risk of inflation by maintaining smooth

distribution and availability of food supplies and anticipating increased demand for goods as the religious holidays approach and the change of harvest season approaches (Haryono, 2024).

Trade openness results from total exports and imports measured as part of gross domestic product to see the relationship between international and domestic transactions. The research results show that TO, in the long term and short term, has a positive and significant effect on economic growth. Based on the estimation results, it is known that the coefficient of the TO variable in the long term is 0.2377596, which means that for every 1 percent increase, it will significantly increase economic growth by 0.23 percent. The short-term estimation results for the TO coefficient are 0.220683, which shows that when there is an increase in TO of 1 percent, it will significantly increase economic growth by 0.22 percent.

These findings further strengthen the theory that increasing trade openness will have a positive impact on improving the economy. These results follow research by Keho (2017) and Omoke et al. (2022), which shows that trade openness increases the national economy significantly and is profitable in line with the development of globalization conditions, thereby encouraging integration between countries. This result follows David Ricardo's theory of comparative advantage, which shows that superior and comparative goods will be exported. Goods with a more expensive production price will be imported.

Trade openness has the potential to increase economic growth by providing access to goods and services, achieving efficiency in resource allocation, and increasing total factor productivity through technology diffusion and the spread of knowledge (Barro & Sala-i-Martin, 1995; Rivera-Batiz & Romer, 1991). Therefore, countries with higher trade openness are expected to perform relatively better than countries with lower trade openness.

Countries that carry out liberalization are required to be able to compete in international markets. Resources will be allocated on a large economic scale and more efficiently. Samuelson and Hecksher-Ohlin developed Ricardo's theory even further. This theory states that countries trade goods and factors contained therein, such as capital and labor. In line with endogenous growth theory, increased liberalization in terms of trade can create capital inflows that can accelerate technology transfer and capital accumulation in the long term. This condition can increase economic growth by increasing the production function and externalities of trade openness (Romer, 1990).

Remittances are money transfers sent to their country of origin by individuals working abroad, such as migrant workers who send money to their families in Indonesia. Remittance has the benefits and convenience of receiving and sending money from within and outside the country by cash or bank transfer. Continuously increasing remittance contributions can strengthen the economy through remittance services. The number of migrant workers with nominal remittances is directly proportional.

If the number of migrant workers falls, then the aggregate level of remittances also falls.

Long-term research results show that the REM variable positively affects economic growth. Based on research results, the long-term REM coefficient is 2.452043, which means that when remittances increase by 1 percent, economic growth will increase by 0.0245 percent. Meanwhile, the REM coefficient in the short term is 2.773247, which means that when remittances increase by 1 percent, the direction is the same but cannot influence economic growth.

The estimated results of remittances in the long term are positive and significant, following the empirical study conducted by Meyer and Shera (2017), which shows that remittances have a positive impact on growth. This impact increases as the amount of remittances is higher compared to GDP. Remittances are one of the country's most significant foreign exchange contributors, contributing 0.8 percent to 1.07 percent of GDP. Households that receive remittances tend to have a higher standard of living. This condition is because remittance recipients will improve the quality of education and consumption, making them less likely to become poor.

The short-term remittance estimation results are supported by an empirical study conducted by Jui et al. (2024), which shows that remittances do not significantly affect economic growth. The analysis shows that although remittances are a key factor influencing economic performance in the research countries, their influence varies depending on the situation. The study also emphasizes that countries that rely too heavily on remittances are vulnerable to sudden declines in inflows, which can disrupt macroeconomic balance.

Septriani and Ariusni (2021) also support the idea that remittances do not affect economic growth in the short term. This could be because the total number of remittances entering Indonesia has not been fully recorded. Some migrant workers do not send their money through official remittance service institutions. The COVID-19 pandemic and increasing public consumption have meant that most families receive remittances that only have enough to meet their daily needs. High remittance costs are also causing problems when sending money to Indonesia.

Indonesian Migrant Workers have not been free from problems such as the Crime of Human Trafficking because, from year to year, there are still fluctuations in the number of illegal migrant workers, which have not been resolved entirely. The Indonesian Migrant Worker Protection Agency in 2022 noted that from 2019 to 2021, there were many problems faced, such as Indonesian Migrant Workers failing to leave, not complying with work agreements, human trafficking, unpaid salaries, acts of violence from employers, and fraud. For the January-April 2023 period, The Indonesian Migrant Worker Protection Agency recorded 592 complaints about Indonesian Migrant Workers placement.

A valid and good ECM model has a negative ECT value (Insukindro, 1991). The ECT value is smaller than $\alpha = 5$ percent, so it can be said that the ECT coefficient

is significant. The ECT imbalance correction coefficient in the form of an absolute value describes how quickly or not time is required to obtain an equilibrium value. The estimation results show that the ECT value has a probability of $0.000 < \alpha = 5$ percent with an ECT coefficient value of -0.53, so it can be concluded that the model used in the ECM analysis is valid and can be used to correct short-term to long-term imbalances of 53 percent.

Table 7. Long Term Robustness Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob	Explanation
FD	-0.0716729	0.0327879	-2.19	0.033	Stationary
INF	-0.1129481	0.1492767	-0.76	0.453	Not Stationary
TO	0.2518816	0.0536758	4.69	0.000	Stationary
LnREM	2.252672	0.7601738	2.96	0.005	Stationary
DUMMY	-1.3159	0.7153972	-1.84	0.072	Stationary
C	-33.09446	12.02814	-2.75	0.008	Stationary

Source: Author Computation (2024)

The long-term robustness test results in Table 7 show that the probability of the FD, TO, LnREM and DUMMY variables is significant in the long term. Economic growth only has a positive effect on the TO and LnREM variables and a negative effect on FD, INF and DUMMY. Long-term robustness regression results based on 56 observations obtained from 2010Q1 to 2023Q4 are as follows:

$$Y = -33,0944 - 1,3159DUMMY$$

$$se = (12.0281) + (0.7153)$$

$$t = (-2.75) + (-1.84)$$

$$(0.008)** (0.072)*$$

$$R^2 = 0.5909$$

Gujarati and Porter (2009) state three measures of a random variable's central tendency: mean, median, and mode. The long-term average economic growth in this benchmark is around -33.0944. Average economic growth during the pandemic was around -1.3159, with actual average economic growth of $[(-33.0944 - 1.3159) = -34.4103]$. The values added up are then divided by a large number of data $(-34.4103/2)$, and the value obtained is -17.2051, which is the mean of economic growth during the Covid-19 pandemic. The R2 value in the long-term test is 0.5909 percent, which shows that all independent variables simultaneously influence 59.09 percent on economic growth. In comparison, 43.91 percent is influenced by other variables not tested in the research.

Table 8. Short Term Robustness Test Results

Variable	Coefficient	Std. Error	t-Stat	Prob	Explanation
FD	-0.1152594	0.0382593	-3.01	0.004	Stationary
INF	0.1930744	0.1670451	1.16	0.253	Not Stationary
TO	0.2237815	0.065778	3.40	0.001	Stationary
LnREM	2.770879	1.809898	1.53	0.132	Not Stationary
DUMMY	-0.4326759	0.447139	-0.97	0.338	Not Stationary
ECT	-0.5575066	0.125748	-4.43	0.000	Stationary
C	0.1122025	0.2209564	0.51	0.614	Not Stationary

Source: Author Computation (2024)

The short-term test results in Table 8 above also have almost the same results as the long-term test, namely data instability occurs when a dummy is added. The test results show that only the FD, TO and ECT variables have a significant probability of economic growth. The short-term regression results are as follows:

$$Y = 0.1122 - 0.4326DUMMY$$

$$se = (0.2209) + (0.4471)$$

$$t = (0.51) + (-0.97)$$

$$(0.614) (0.338)$$

$$R^2 = 0.4422$$

Average economic growth per year during the pandemic and takes the mean or average of $[(0.1122 - 0.4326) = -0.3204]$. The values that have been added up are then divided by a lot of data $(-0.3204/2)$ and the value obtained is -0.1602 , which is the mean of economic growth during the Covid-19 pandemic in the short term. The R^2 value in the short-term test is lower than the long-term, namely 0.4422 percent, which shows that all independent variables simultaneously have an influence of 44.22 percent on economic growth, while 55.78 percent is influenced by other variables not tested in the research.

These results also show that economic growth has a positive effect on TO and LnREM and a negative effect on FD, INF, and DUMMY. However, only the FD, TO, and ECT variables significantly affect economic growth in the short term. The estimation results above also show that the ECT value has a probability of $0.000 < \alpha = 5$ percent with an ECT coefficient value of -0.55 , so it can be concluded that this model is valid and can be used to correct short-term to long-term imbalances of 55 percent. The robustness test results show that the model is more robust when the dummy is not added. However, before and when the dummy is added, the estimation results only differ in significance. Long-term models are more robust than short-term models.

Dummy variables in the research are used to see the effect of the pandemic and non-pandemic periods on economic growth. The impact of the Covid-19 pandemic on

the economy has been an issue that has been widely discussed since the beginning of 2020. The increasing number of cases has led to the need for urgent action, such as social restrictions. The necessary measures to maintain social distancing force all sectors of activity to reconsider their activities (Zamfir & Iordache, 2022). The research results show that the dummy Covid-19 has a negative and significant effect on economic growth in the long term. In contrast, in the short term, the dummy Covid-19 does not significantly affect economic growth but in the appropriate direction. Based on the robustness test results, the dummy coefficient in the long term is -1.3159, while the dummy coefficient in the short term is -0.4326759.

The dummy COVID-19 estimation results are supported by empirical studies conducted by Huang et al. (2023), which show that changes in the number of deaths due to COVID-19 and restrictions or lockdowns affect economic growth. These empirical studies generally have statistically significant impacts, although the magnitude of these impacts varies depending on the economy and period considered. The direct impact caused by the COVID-19 pandemic is felt in the health, education, social, and economic sectors. The health crisis has caused many deaths due to the COVID-19 virus.

In their empirical study, Barrett et al. (2021) stated that countries with greater pandemic-related fiscal responses are expected to experience smaller losses. The government is reallocating the budget and refocusing activities to speed up the procurement of goods and services and the budget for handling COVID-19. The government also provides a social safety net to increase people's purchasing power through social assistance (Nainggolan, 2021). Boubaker et al. (2023), in their empirical study, stated that the economy may be affected by the strict policies implemented by the government to overcome COVID-19. However, in the long term, there may be major changes in the views of investors and policymakers. Before COVID-19, investors had little consideration regarding the risks of global economic shocks that could still be overcome. COVID-19 is likely to change future risk assessment and forecasting due to its unprecedented global scope.

CONCLUSION

The issue of economic growth is an important topic because it concerns all sectors of life, including the financial sector. The research discusses the influence of financial deepening on economic growth in Indonesia in 2010-2023. The results show that financial deepening in the long term and short term during the research period has a negative and significant effect on economic growth in Indonesia. It is hoped that the importance of financial literacy that needs to be instilled in all levels of society can align with the concept and comprehensive understanding of the technology or financial infrastructure used. Domestic challenges in the financial sector originate from limited sources of long-term economic financing, income gaps, and low levels of productivity, which are obstacles. Simultaneously, stakeholder expectations regarding future financial sector performance will also increase.

Another conclusion from this research also makes it clear that financial deepening can be encouraged by balanced banking dominance, which can be achieved by encouraging the diversification of financial products. This encourages financial deepening through effective coordination between Bank Indonesia, OJK, and the government. The challenges in the financial sector and the targets that will be achieved to encourage financial deepening and financial inclusion can be achieved well. In addition, Bank Indonesia is expected to increase supervision of financial activities. Financial deepening, which continues to increase, will encourage economic growth and increase economic stability.

It is hoped that the government will continue to increase trade openness by shifting from exports of raw materials and semi-finished goods to high-value-added goods. Remittances are a factor that influences economic growth, so it is necessary to pay attention to protecting Indonesian migrant workers who work abroad. This research also suggests that future researchers who use this topic can add other variables outside the variables studied in this research, for example, using non-monetary variables in the form of a corruption index, government quality, or by adding environmental variables to get more varied results. Future researchers can also increase the research period or use other analytical tools.

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