

Determinant Factors Fintech Growth of Indonesia Gross Domestic Product

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Abstract

The development of fintech is part of Indonesia's economic growth, one part peer-to-peer lending fintech is the focus of this study within the fintech space. Fintech applications offer an alternative to traditional funding sources for addressing the requirements of the Indonesian populace. Thus, the purpose of this study is to examine the internal influences on economic growth of fintech companies in Indonesia. The study's premise is that the dependent variable, Indonesian GDP, is influenced by the independent variables, net interest margin, yield on earning assets, capital ratio, company scale, cost to income ratio, interest income share, and gender. The novelty of research is that there is a negative correlation but a significant effect between the Net Interest Margin variable of peer-to-peer lending fintech companies and Indonesia's GDP. Fintech peer-to-peer lending companies charging high fees to borrowers so that the risk of high loans as a result decreases borrower demand not only that if the interest is high, but it will also have an impact on default by the community so that the default rate on fintech companies in Indonesia is high. If there is bad credit, then it greatly affects economic conditions in Indonesia. Peer-to-peer lending fintech companies with good asset management, operational management, and loan interest income management will help economic growth in Indonesia.

Keywords: Economic, Fintech, Gender, Gross Domestic Product, Ratio

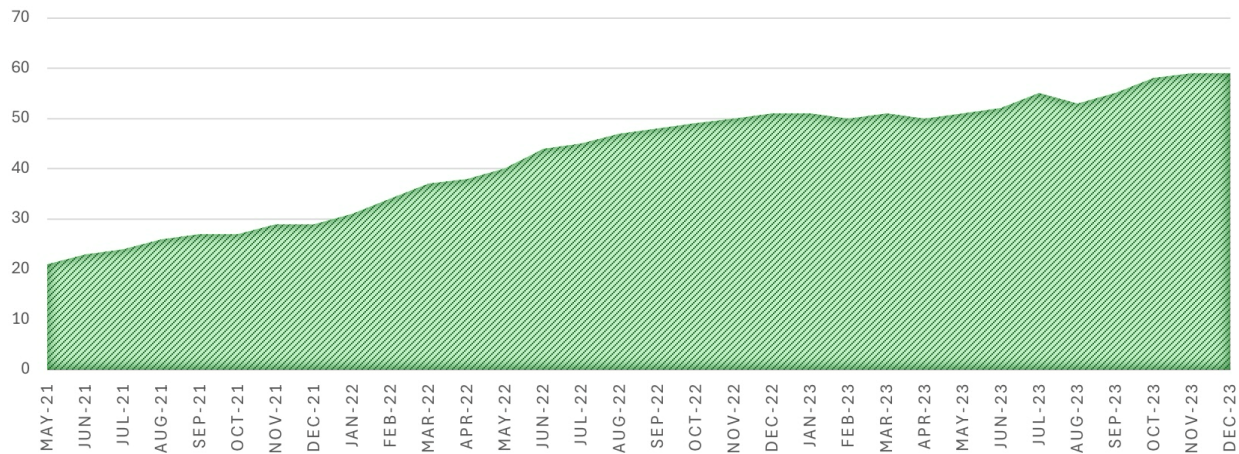
INTRODUCTION

Indonesia's digital economy is growing rapidly thanks to technological disruption to impact people's lifestyle pattern (Santoso et al, 2021). This digitalization provides an important role to be able to contribute to economic growth (Kusairi et al, 2023). According to the SEA e-Conomy 2022 report, by 2022, the digital economy will be worth US\$77 billion, or 5.8% of the GDP. This indicates that Indonesia's digital economy has grown significantly, both in absolute terms and in relation to the country's entire GDP. In 2020 Indonesia is in a state of Covid-19 pandemic which resulted in Indonesia's 2020 GDP falling very far to -2.07% from the GDP of previous years which grew at 5%. Central Agency of Statistics noted that Indonesia's GDP in 2021 has increased from the previous year by 3.70%. In 2022 and 2023 Indonesia's GDP has returned to the growth rate of around 5% from before being affected by Covid-19, Indonesia's 2022 GDP grew by 5.31%. Indonesia's GDP in 2023 amounted to IDR 20,892.4 trillion with a growth of 5.05% (Central Agency of Statistics).

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Note: in Trillion

Figure 1. Total Loans

The total loans provided by peer-to-peer lending to the public are substantial. According to a report issued by the Financial Services Authority, the total loans in May 2021 amounted to 21 trillion IDR. By the end of 2021, the total loans had reached 29 trillion IDR. In mid-2022, specifically in June, the total loans amounted to 45 trillion IDR. This amount continued to increase by nearly 15 trillion IDR, reaching 59 trillion IDR by the end of 2023. This increase shows good development in financial technology, especially peer-to-peer lending in Indonesia. these developments indicate positive economic activity to help economic growth in Indonesia.

LITERATURE REVIEW

Now peer-to-peer lending fintech is growing rapidly (Edward et al, 2023), however, research on the implications and effects of its rise in Indonesia on the country's economy as a whole is still lacking. According to (Aaker and Keller, 1990) consumer theory and disruptive innovation theory, fintech companies and other newcomers leverage technological advancements and innovative business strategies to offer more affordable and easily accessible services than the traditional financial industry, which can impact economic growth. Fintech, which includes peer-to-peer financing, is anticipated to keep expanding in the future develop (Pohan et al, 2020). Economic growth theory states that technology is the most important aspect in spurring economic growth (Siddiqui et al, 2020) by encouraging production efficiency and the creation of new products (Knewtson & Rosenbaum, 2020).

This study applies the independent variables used previously by (K€oster and Pelster, 2017), namely net interest margin, yield on earning assets, capital ratio, company scale, interest income share and the cost to income ratio. These factors are frequently used to analyze bank performance; one example of this is seen in a study (Corbet et al., 2023) that addresses the effect of fintech companies on bank performance in China.

GDP, or gross domestic product, is a measure of economic growth and is the dependent variable in this research. According to (Karaoulanis, 2018), the technology industry can boost productivity and GDP. Fintech, or financial technology, is an industry that must be observed whether fintech can also increase GDP (Vasileva et al, 2017). (Liu and Chu, 2023) found that advances in fintech technology reduced economic setbacks due to the pandemic.

Economic growth can be achieved through more effective and inclusive financial services provided by fintech lending platforms (Suryono, 2021). By changing the conventional lending model, fintech can transform the financial industry by increasing financial inclusion by offering innovative and inclusive lending solutions (Siddiqui, 2020). Economic growth could be accelerated by it (Morakinyo and Sibanda, 2016). Not all research indicates that fintech contributes significantly to economic expansion. According to research by Junarsin et al. (2021), while the fintech industry's rapid expansion has many exciting potentials, its contribution to the nation's

economic growth through peer-to-peer lending is still lagging. According to this study, fintech still has a way to go before it can truly its full potential.

The independent variables used are margin of Net Interest (NIM). Yield on Earnings Assets (YEA) is the ratio of interest revenue to income-producing assets, while Net Interest revenue (NIM) is a measure of net interest income to total assets generated by the organization. These two factors were utilized by (Phan et al., 2020) to describe how fintech companies affect bank performance in the US. Their study's findings indicate that fintech startups benefit bank performance with NIM and YEA increasing by an average of three to six percent.

CAP and SIZE variables are used in this study as independent variables. The Capital Ratio (CAP) variable is used to calculate the amount of capital owned compared to total assets. An increase in the amount of capital compared to total assets shows good results (Shaban and James, 2018). The SIZE variable is the scale of the company which is measured based on the total assets of the company logarithm. Overall, assets can increase the profitability and operational effectiveness of the company (Djalilov and Piesse, 2016).

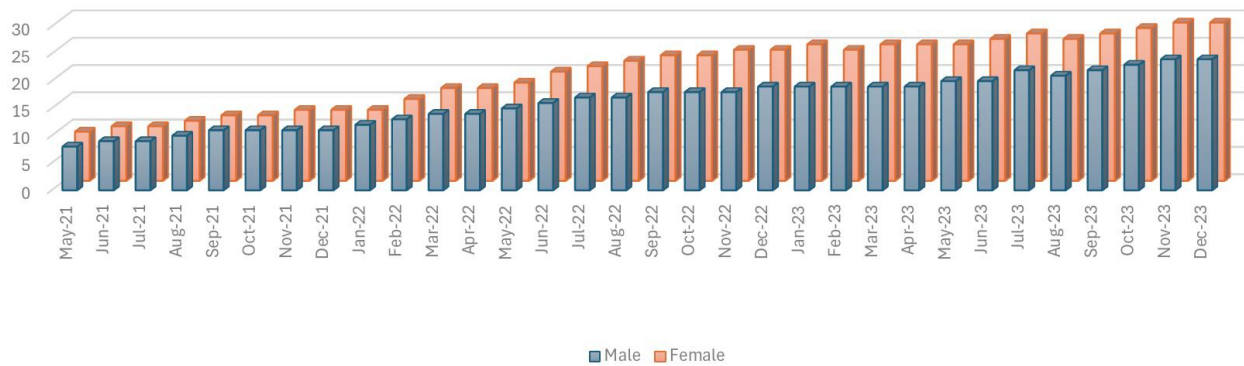
Cost to Income Ratio (CTI) and Interest Income Share (IIS) variables are also used in this study as separate factors. The CTI variable is employed to compare overall costs to the company's total revenue. The IIS variable is used to measure how much interest income contributes to the company's total revenue. In research (Dietrich and Wanzenried, 2011) If CTI and IIS are high, the company experiences a decrease in effectiveness and output. This illustrates the negative relationship between CTI and ISS to total company revenue (Zhang et al, 2017).

Another variable used in this study is the gender of users of peer-to-peer lending fintech companies to compare the amount of loans made by men and women and the degree of loan payment accuracy. Similar to Chinese peer-to-peer fintech research, (Chen et al, 2020) found that men apply for loans more often than women and show that women's loan applications are less successful.

This study has an initial thought about the impact of peer-to-peer lending fintech enterprises on Indonesia's economic growth. The findings corroborate studies with comparable topics and factors conducted by (Dasilas and Karanović, 2023); (Phan et al, 2020); Song et al, 2022; and (Chen et al, 2020). The first variable is that Gross Domestic Product (GDP) in Indonesia is influenced by the Net Interest Margin of peer-to-peer lending fintech enterprises. Businesses that make significant earnings contribute to Indonesia's economic expansion (Jagirani, 2023). According to research (Demirgüç-Kunt et al, 2022) there is a favourable correlation between GDP and NIM. The second variable, Gross Domestic Product (GDP) of Indonesia is impacted by Yield on Earning Assets (YEA) peer-to-peer lending fintech businesses. Net interest income to earning assets is the yield on earning asse. This variable was used by (Dasilas and Karanović, 2023) to talk about how fintech companies affect bank performance in the United States (US). The findings demonstrated that fintech businesses improve bank performance.

Peer-to-peer lending fintech enterprises' fluctuating Capital Ratio (CAP) has an impact on Indonesia's GDP. The capital owned as a percentage of total assets is determined using the CAP ratio. Good outcomes are indicated by an increase in capital as a percentage of total assets. A low CAP score suggests that the business may struggle to manage the risk of adverse economic conditions, which could make it harder for it to meet its responsibilities (Van Home, 1977). The Company Scale (SIZE) of peer-to-peer lending fintech enterprises influencing Indonesian GDP is represented by variable SIZE. The SIZE ratio displays the total assets that the business has. Greater overall assets held by banks can contribute to faster economic growth. According to studies done by (Pasiouras and Kosmidou, 2007), there is a bad correlation between bank size and economic growth.

The fifth and sixth variables are Cost to Income Ratio (CTI) and Interest Income Share (IIS) of peer-to-peer lending fintech companies that affect GDP in Indonesia. (Smith et al, 2018) conducted research showing that CTI and IIS have a significant effect on GDP in developed countries. High CTI values can reduce GDP, while high IIS can increase GDP. Variable IIS of peer-to-peer lending fintech companies affects GDP in Indonesia. In research (Dietrich and Wanzenried, 2011) the ISS variable shows that if interest income makes up a large percentage of total income, banks will be less profitable. This demonstrates the detrimental correlation between bank performance and ISS.



Note: in Billion

Figure 2. Total Gender Loans

The seventh variable is the gender of users of peer-to-peer lending fintech companies affecting Indonesian GDP. This is done to see which gender of users between men and women has more influence on economic growth in Indonesia. Research by (Chen et al, 2023) shows that men use fintech more than women with an average fintech usage of 29% men and 21% women. Furthermore, it is seen whether all X variables; Net Interest Margin (NIM) and Yield (YEA) relate to one another, Capital Ratio (CAP), Company Scale (SIZE), Cost to Income Ratio (CTI), Interest Income Share (IIS), and Gender of peer-to-peer lending fintech companies together affect Y variable economic growth (GDP) in Indonesia.

Based on the research objectives to analyze the determinants of financial technology development, especially peer-to-peer lending on economic growth in Indonesia, this framework provides the basis for the following study hypothesis is generated:

H1: Net Interest Margin (NIM) of peer-to-peer lending fintech companies affects economic growth (GDP) in Indonesia.

H2: Yield on Earning Assets (YEA) peer-to-peer lending fintech companies affect economic growth (GDP) Indonesia.

H3: The Capital Ratio (CAP) of peer-to-peer lending fintech companies affect economic growth (GDP) Indonesia.

H4: Company Scale (SIZE) peer-to-peer lending fintech companies affect economic growth (GDP) Indonesia.

H5: The Cost to Income Ratio (CTI) of peer-to-peer lending fintech companies affect economic growth (GDP) Indonesia.

H6: The Interest Income Share (IIS) of peer-to-peer lending fintech companies affect economic growth (GDP) Indonesia.

H7: The gender of peer-to-peer lending fintech companies users affect economic growth (GDP) Indonesia.

METHODS

This research aims to examine the impact of fintech development in Indonesia on the country's economic growth, as evidenced by data on GDP growth in 2021–2023 and the statistical report of peer-to-peer lending fintech companies released by the Indonesia Financial Service Authority in May 2021–December 2023. The present study postulates that the GDP of Indonesia is influenced by various factors, including net interest margin, yield on earning assets, capital ratio, company scale, cost to income ratio, interest income share, and gender of users of peer-to-peer lending fintech companies. These are the calculations that were made for this investigation:

Collect data from the statistical report of peer-to-peer lending fintech companies issued by Indonesia Financial Service Authority from May 2021 to December 2023.

Collecting data on Indonesia's economic growth rate, namely Gross Domestic Product (GDP) in 2021-2023.

Calculating the value of the variables used Net Interest Margin (NIM), Yield on Earning Assets (YEA) Capital Ratio (CAP), Company Scale (SIZE), Cost to Income Ratio (CTI), Interest Income Share (IIS), and Gender of peer-to-peer lending fintech companies in Microsoft Excel.

Perform multiple linear statistical data processing using Ordinary Least Square (OLS) using e-views.

$$GDP_t = \alpha + \beta_1 NIM_t + \beta_2 YEA_t + \beta_3 CAP_t + \beta_4 SIZE_t + \beta_5 CTI_t + \beta_6 IIS_t + \beta_7 Gender\ Male_t + \beta_7 Gender\ Female_t + \varepsilon$$

RESULT

The search was carried out to examine how the independent factors in this study, namely net interest margin, yield on earning assets, capital ratio, company scale, cost to income ratio, interest income share, and gender, on the dependent variable, namely Indonesian GDP. The calculation is done monthly from May 2021 to December 2023.

Table 1. Multiple Linear Statistics

Variable	Coefficient	Probability
C	18.10558	0.0000
Net Interest Margin (NIM)	-7.614829	0.0136**
Yield on Earning Assets (YEA)	0.031990	0.0001***
Capital Ratio (CAP)	0.148359	0.2142
Company Scale (SIZE)	0.124376	0.0134**
Cost to Income Ratio (CTI)	2.02E-11	0.0475**
Interest Income Share (IIS)	0.086154	0.0027***
Gender Male	-0.071307	0.4216
Gender Female	0.092917	0.1579
Heteroscedasticity		0.3888
Autocorrelation		0.0592
Normality		5.5555

Note: Sig ***1%, **5%, *10%

If the probability value is less than 5%, the independent variable is considered to have an impact on the dependent variable. Table 1 indicates that there are five variables that impact Indonesia's economic growth: Net Interest Margin (NIM), Yield on Earning Assets (YEA), Company Scale (SIZE), Cost to Income Ratio (CTI), and Interest Income Share (IIS). There are two variables that have no effect on Indonesia's economic growth, namely Capital Ratio (CAP) and Gender.

$$GDP_t = 18.10558 - 7.614829NIM_t + 0.031990 YEA_t + 0.148359 CAP_t + 0.124376 SIZE_t + 2.02E11 CTI_t + 0.086154 IIS_t - 0.071307 Gender\ Male_t + 0.092917 Gender\ Female + \varepsilon$$

Based on table 1, NIM has a noteworthy impact on Indonesia's GDP of 0.0136; a unit increase in NIM will result in a 7.614829 reduction in NIM. The increase of 0.031990 in YEA has a noteworthy impact on the GDP of Indonesia of 0.0001, meaning that if the value of YEA increases, GDP increases significantly.

The CAP variable increased by 0.148359 with a likelihood value of 0.2142, indicating that while the CAP value rose, Indonesia's GDP was not significantly impacted. On the other hand, should CTI and IIS rise, Indonesia's

GDP will follow suit. Indonesia's GDP is significantly impacted by the 2.02E-11 increase in the CTI by 0.0475. The increase in IIS of 0.086154 has a noteworthy impact on the GDP of Indonesia of 0.0027.

The quantity of loans made by each gender—male and female—was the gender variable employed in this study. Table 1 shows that the gender of men has no discernible impact on Indonesia's GDP. The probability value of 0.4216 indicates a drop of 0.071307 in the male gender. With a probability value of 0.1579, the female gender increased by 0.092917, indicating that while the number of loans from women increased, it had no discernible impact on Indonesia's GDP.

To determine whether there is a variance inequality between the residuals of two observations, the heteroscedasticity test is performed. Homoscedasticity, or the similarity of variance across the residuals of different observations, is a feature of the proper regression model. The Breusch-Pagan-Godfrey test is the methodology employed in this study; if the Chi-square probability value is less than 5%, there is a heteroscedasticity issue. The heteroscedasticity test results in this investigation amounted to 0.3888, which means there is no heteroscedasticity problem.

Autocorrelation test is conducted to see the deviation that occurs between one observation to another. In research with time series data, the autocorrelation test is very important to do because autocorrelation can cause inefficient estimates, unstable models, and errors in hypothesis testing. In this study, the method used is when using the Breusch-Godfrey Serial Correlation LM test, an autocorrelation issue is present if the Chi-square probability value is less than 5%. The study's autocorrelation test yielded a result of 0.0592, indicating the absence of an autocorrelation issue.

The normality test is done to determine whether the model's independent and dependent variables have normal distributions. The distribution of data in or close to the average is known as the normal distribution. The Jarque-Bera test is the approach employed in this investigation; if the value yields a result smaller than 5%, the study's data are not normally distributed. The outcomes of the normalcy test in this study amounted to 5.5555, which means the data is normally distributed.

Table 2. Partial Hypothesis Test

Hypothesis	Probability	Result
H1 (NIM)	0.0136**	Accepted
H2 (YEA)	0.0001***	Accepted
H3 (CAP)	0.2141	Rejected
H4 (SIZE)	0.0134**	Accepted
H5 (CTI)	0.0475**	Accepted
H6 (IIS)	0.0027***	Accepted
H7 (Gender Male)	0.4216	Rejected
H7 (Gender Female)	0.1579	

Note: Sig ***1%, **5%, *10%

Partial hypothesis testing was conducted to observe how each independent variable in this study affects the dependent variable. The study's hypothesis is that Indonesia's GDP growth is influenced by the independent variables (net interest margin, yield on earning assets, capital ratio, company scale, cost to income ratio, interest income share, and gender). If the probability value is less than 5%, the independent variable is said to have a significant effect on the dependent variable; if the probability value is larger than 5%, on the other hand, the independent variable is said to have no significant effect on the dependent variable.

Table 2 shows that the first, second, fourth, fifth, and sixth hypotheses—Net Interest Margin (NIM) of 0.0136, Yield on Earning Assets (YEA) of 0.0001, Company Scale (SIZE) of 0.0134, Cost to Income Ratio (CTI) of 0.0475, and Interest Income Share (IIS) of 0.0027—are all accepted because the resulting probability value is

less than 5%. This indicates that peer-to-peer lending fintech companies' NIM, YEA, SIZE, CTI, and IIS have a major impact on Indonesia's economic growth (GDP).

Based on table 2, the third and seventh hypotheses are rejected because the resulting the gender of users, which is 0.1579 for males and 0.4216 for females, and the Capital Ratio (CAP) of 0.2142 both have probability values more than 5%. Thus, there is no discernible relationship between the gender of peer-to-peer lending fintech users and CAP and Indonesia's economic growth (GDP).

Table 3. Simultaneous Hypothesis Test

Hypothesis	Result
F-Statistic	0.000000
Adjusted R-squared	0.971469

To determine if the independent factors simultaneously affect or have no effect on the dependent variable, the F test is used. The overall independent variable has an impact on the dependent variable if the F test results are accepted. If the probability value is less than 5%, the F test is approved. Table 3 indicates that the F test result is 0.000000, which is less than 5%, indicating that the eighth hypothesis in this study—that Variable X (net interest margin, yield on earning assets, capital ratio, company scale, cost to income ratio, interest income share, and gender) of peer-to-peer lending fintech companies simultaneously affect economic growth (GDP) in Indonesia.

The test for coefficient of determination is used to assess how well the model fits the data. The R-squared number indicates how much the independent variable influences the dependent variable; this test can explain this relationship. The better the explanation of the independent variable to the dependent variable, the higher the resulting R-squared number. Table 2 indicates that the independent variable explains the dependent variable 97% of the time, with an adjusted R-squared value of 0.971469. The remaining R-squared value of 3% indicates that factors not included in this study account for the remainder of the value.

DISCUSSION

Multiple linear statistical data analysis using Ordinary Least Square (OLS) is done in order to ascertain how independent factors relate to and affect the dependent variable, Kerimov 2023. The purpose of this study was to ascertain how Net Interest Margin (NIM) and Yield (YEA) relate to one another, Capital Ratio (CAP), Company Scale (SIZE), Cost to Income Ratio (CTI), Interest Income Share (IIS), and Gender on Indonesia's economic growth (GDP).

A high Net Interest Margin (NIM) means that peer-to-peer lending fintech companies charge high fees to borrowers, resulting in high loan risk (Chukwuogor, 2021), which reduces borrower demand. High NIM also means that companies charge high interest rates to borrowers. This will lead to high default rates which can negatively impact fintech enterprises that facilitate peer-to-peer lending and the overall economy (Abdelmoneim and Yasser, 2023). Consistent with the findings of the research, which show that NIM is adversely correlated yet significantly affects Indonesia's GDP.

The study's findings show that Yield on Earning Assets (YEA) significantly affects and has a positive link with Indonesia's GDP. This shows that peer-to-peer lending fintech companies generate effective revenue. This effective performance can increase the amount of funds to be loaned so that it will benefit borrowers who need funds to conduct business or just for consumption (Alkhazaleh, 2017). Increased consumption can drive demand to increase production and create jobs. This will affect the economy so that it contributes to GDP (Cornelli et al, 2023).

Capital ratio (CAP) is seen from total capital to total company assets (Msomi and Olarewaju, 2022). The findings demonstrated that while CAP has a good value, it has no appreciable impact on Indonesia's GDP. This can happen because companies do have high assets but are not used productively. This means that these assets are not allocated to provide loans so that there are few funds available for lending, the impact is that economic growth will be limited.

Fintech peer-to-peer lending companies that have large assets will be able to raise a lot of capital from investors, with more available, the company can lend more to individuals and businesses. Fintech peer-to-peer lending companies with large assets can also use them to invest in technology (Azarenkova et al, 2018). Good technology can help companies to manage loans well, offer services well, and assess risks more accurately. This can accelerate the flow of funds in the economy (Shubita and Alrawashedh, 2023). According to the study's findings, which demonstrate a favourable relationship between a company's scale (SIZE) and Indonesia's GDP.

The results showed a low Cost to Income Ratio (CTI) value and a substantial impact on the GDP of Indonesia. Low CTI suggests that peer-to-peer lending fintech companies operate efficiently with low costs to revenue generated. (Khan, 2022) The profitability of such companies will enable them to provide low-cost services to borrowers, thereby increasing the number of transactions and spinning off economic activity to help economic growth.

Interest Income Share (IIS) is the result of loan interest income over total revenue. A high IIS indicates that the peer-to-peer lending fintech company derives part of its revenue from loan interest (Mulska et al, 2023). With such good results, the company has good financial health to continue providing services to borrowers by continuing to increase the amount of loan funds and expanding the capacity of credit access to individuals and businesses (Ismanto et al, 2023). The process of sustainability will help the community economy and help overall economic growth. The outcomes additionally demonstrate that IIS has a strong correlation and a notable impact on GDP.

The findings indicated that there was no substantial impact of male gender on Indonesia's GDP and that there was a negative association. (Wijaya and Kurniawan, 2020) This may occur because loans taken out by men are typically used for less worthwhile endeavours that yield little profit. Emekter et al. (2015) attribute the frequent defaults that cause losses for peer-to-peer lending fintech companies on ineffective financial management. The reduction in capital due to default will result in a decrease in the amount of available funds, thereby hindering economic activity and economic growth.

In female gender, the results showed a positive relationship but no significant effect on Indonesia's GDP. Although women use loans productively and efficiently so that they have a positive value on the economy (Wong et al, 2023), it does not significantly affect the economy because women apply for small loans to be used to manage small-scale businesses and minimal risk so that the economic turnover that occurs is very small to contribute to economic growth.

(Dharmastuti and Laurentxius, 2021) In traditional finance such as banks, not everyone can make loans because there are conditions that must be met, for example, such as women who work as housewives, who certainly do not meet the requirements because they do not have their own income (Kholidah et al, 2022). With this peer-to-peer lending fintech, the female gender also has access to loans. (Baruna et al, 2023) This will bring gender equality and can help the financial efficiency of fintech peer-to-peer lending firms, thus that it will affect economic growth in Indonesia (Rosavina et al, 2019).

So that the research objectives are answered that there are several determinant factors examined in this study that can help the growth of Indonesia's Gross Domestic Product. To readers and future researchers, these results are obtained based on the data used in the study so that different data will produce different explanations.

CONCLUSION

The goal of this research is to identify the factors that influence the development of financial technology, particularly peer-to-peer lending, and how they affect Indonesia's economic growth as measured by Gross Domestic Product (GDP). Net interest margin, capital ratio, yield on earning assets, corporate scale, cost to income ratio, interest income share, and gender are among the drivers. The most significant component comes from the research findings, which show that loan interest is the primary source of revenue for peer-to-peer lending financial technology companies. This is evident from the interest income share, yield on earning assets, and net interest margin values, all of which have a major impact on Indonesia's GDP. High loan interest income and accompanied by efficiency in management to maximize loan interest income will increase company

profitability. Peer-to-peer lending fintech companies must manage company operations efficiently. Conducting company operations by taking into account the costs incurred against the income generated or the profitability of the is significantly impacted by the cost to income ratio company. With good company profitability, the company's assets will increase. Companies must be able to manage their assets wisely and productively to continue to carry out economic activity so that the scale of the company will be even greater.

To readers, especially peer-to-peer lending companies to manage the company well. based on this research by providing services at the right cost to borrowers will show good results to the company accompanied by good management. To readers who are the public are expected to use these loans wisely. by carrying out economic activities. increased production and efficient consumption can help economic growth. It is advised that control variables like interest rates or inflation be included in future studies to examine the impact of macroeconomic issues on the evolution of financial technology on Indonesia's economic growth.

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