# The Influence of Financial Technology on Net Interest Margin With Moderating Ownership Structure

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## ABSTRACT

The purpose of this study is to study the impact of financial technology or fintech on net interest margin (NIM) using ownership structure as a moderating variable. The method uses a quantitative method. The results include that fintech adoption has a significant negative effect on NIM, ownership structure has a significant negative effect on NIM, ownership structure can positively moderate the effect of fintech adoption on NIM. The benefits of the study are reference materials for investors in the selection of investments related to the adoption of fintech in the banking sector, material that bank management should consider when improving performance, especially NIM and fintech adoption, and materials for the scientific development from fintech to the industry.
*Keywords : Fintech, NIM, Ownership Structure, IDX.*

## 1. INTRODUCTION

Financial Technology known by Fintech. Fintech known as the new innovation of finance using technology. Fintech known as new digital transaction on banking industry. Fintech have many advantages for bank especially for efficiency. The existence of Fintech makes changes in bank performance. Fintech changes people's economic and business transaction behavior. Fintech can affect on the revenue of Net interest margin on Banks. Net Interest margin income as known by NIM. NIM is defined as a profitability for Banks from net interest income. Net interest income is conducted by interest revenue reduced by interest expenses. Fintech was found to reduce the number of NIMs for a number of banks [1]. However, these findings are inversely proportional to researchers who found that bank NIM tends to increase since collaboration with Fintech [2]. This clearly creates a research gap.

Other findings say that banking NIM in Indonesia tends to be high due to small business credit [3]. These results mean that a bank's NIM will increase if it has a lot of micro small business credit where Fintech is also widely used by small business actors. This explanation can be interpreted that Fintech can increase income from high interest margin differences for banks.

Research that strengthens this opinion is that Fintech have connection with the bank's net interest margin. Fintech is believed in the results of empirical studies that fintech makes bank governance efficient so that the margins obtained by banks are getting smaller. The research that has been carried out has resulted in the finding that there is a connection between Fintech and nim [4].

Using fintech can provide convenience and speed in the credit process. Collaboration with fintech can be expanded by increasing the number of ceilings given to fintech companies, increasing the number of collaborations with fintech companies, and increasing the types of fintech services.

Ownership structure is also influence on net interest margin. Ownership structure as policy on managing the interest performance. Some empirical support related to fintech, ownership structure and interest margins includes a relationship

between foreign ownership and NIM [5], ownership concentration and bank profits [6], financial innovation and bank performance [7], Fintech and financial performance [8] and fintech influences bank performance which is moderated by size [9].

Based on the research gap and the importance of fintech research for economic actors and management, this research will find empirical evidence of the influence of fintech on interest margins which is moderated by the ownership structure of banks.

## 2.  LITERATURE REVIEW

### 2.1  Financial Technology

Financial Technology (Fintech) have several studies such as the relationship between Fintech MSMEs and the green economy [10]. Financial Technology, which is usually called fintech, is a contemporary technology in the digital era that provides financial services such as payments, loans, storing money digitally using smartphones. Fintech can use digital transfer methods or use QRIS with barcode scanning.

Fintech is divided into four types, namely Peer to Peer lending and crowdfunding; investment risk management; payment, clearing and settlement; as well as market aggregators. One of the government banks, namely BRI, has collaborated with fintech through P2P lending services with Investree in distributing retail credit, which is currently still a pilot project [2].

### 2.2 Net Interest Margin

Net Interest Margin [11] is the difference between credit interest and deposit interest. NIM is the bank's profit obtained from asset management and its intermediation function in the form of loan interest and savings (deposit) interest. NIM is a measure of the level of bank efficiency. NIM is also a measure of profitability or earnings for banks. NIM is net interest income divided by average productive assets [12]. Net interest income is interest income minus interest expense. The productive assets that are taken into account are productive assets that generate interest (interest bearing assets). Previous results show that research is related to NIM of public banks in Indonesia [13]. The high NIM can be interpreted from two points of view [14] such as First, the high NIM reflects the low level of bank efficiency and uncompetitive banking market conditions. Second, the high interest margin reflects the inadequacy of banking regulations and high information asymmetry.

### 2.3 Ownership Structure

Ownership structure is the comparison between the number of shares owned by insiders and offers possessed by speculators. In a company, both bank and non-bank, there are distinctive characteristics of proprietorship within the company, such as:

1. Scattered Ownership (scattered proprietorship). It was found that companies with more scattered possession given more prominent rewards to administration than companies with more concentrated possession.

2. Concentrated Ownership (closely held). In this sort of possession, two bunches of shareholders emerge, to be specific controlling interface and minority intrigued shareholders [15].

3. Ownership by the government, which suggests possession is concentrated, will really energize company controllers to dispossess minority shareholders.

Another ownership is organization proprietorship, specifically possession of a company by a non-government office or ordinarily within the shape of a constrained risk company. Regulation presence as portion of the company proprietor capacities to screen company execution. Expansive regulation possession (more than 5%) demonstrates its capacity to screen administration is getting superior. The more prominent the organization proprietorship, the more effective the utilize of company resources so that the company will be free from budgetary issues. Observing carried out by teach is able to substitute for other office costs (obligation, profits and administrative possession so that organization costs diminish and company esteem increments. Possession structure influences bank productivity [16].

A company's ownership structure ought to be considered as the result of endogenous choices that reflect shareholder impact. A conveyed (or concentrated) possession structure, in case brought almost by shareholders, ought to be one that maximizes shareholder benefits, so that, as a result, there ought to be no precise relationship between varieties in proprietorship structure and varieties in firm execution.

### 2.4 Hypothesis

Financial Technology and Net Interest Margin

The NIM performance of banks after the adoption of fintech shows that the number of NIM is significantly different after the use of fintech [17]. The impact of fintech on bank profitability as measured by NIM that fintech significantly influences changes in NIM [18], fintech encourages competition banks as measured by NIM where fintech adoption encourages changes in bank behavior as seen from the low NIM, fintech adoption is also accompanied by falling bank fees [19]. Thus the hypothesis that can be made is as follows:

H 1: Fintech has a significant negative effect on Net Interest Margin

Ownership Structure and Net Interest Margin

To link ownership structure with how the company behaves in taking company risks cannot be separated from company management. Where the relationship between management and company owners must be stated in a contract. This contractual relationship between company owners and management can be included in agency theory. Agency theory emphasizes the agency relationship that occurs when one party (principals) delegates work to another party (agent) who carries out the work. [20] defines an agency relationship as a contract where one or more principals (owners) use other people or agents (managers) to carry out company activities. In agency theory, what is meant by principals are shareholders/owners/investors, while agents are management who manage the owner's assets in the company. Previous results show that there is a connection between ownership structure and performance [21]. Thus the hypothesis that can be made is as follows:

H2: Ownership structure has a significant negative effect on Net Interest Margin

Moderation of ownership structure influences Fintech and NIM

Ownership structure can increase the influence of Fintech on NIM. The more dominant the influence of ownership structure, the more management policies can influence fintech results on NIM acquisition. Ownership structure can influence margin performance of fintech [21]. So, ownership structure can strengthen fintech on net interest margin performance.

Thus the hypothesis that can be made is as follows:

H3: Ownership structure can significantly moderate Fintech on Net Interest Margin.
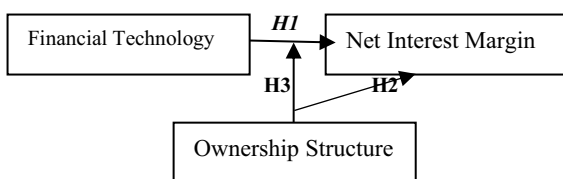
### Research Framework



**Figure 1 Research Framework**

## 3. METHOD

This research uses quantitative methods. Quantitative method is a research method that can be calculated with a certain number of units or expressed in numbers using secondary data [24]. This research is a study of cause and effect relationships, namely the influence of the independent variable on the dependent variable.

The population in this research is conventional banks, both state-owned and private, on the Indonesia Stock Exchange (BEI) in 2017-2021. Meanwhile, the sampling technique uses a purposive sampling method, namely selecting samples with certain objectives, certain criteria or quotas. Data was obtained from the Indonesian bank website, IDX, and bank websites. The research use fourteen Conventional Banks in IDX as sample. The sample for this research is Bank Tabungan Negara, Bank Bisnis Internasional, Bank Rakyat Indonesia, Bank Negara Indonesia, Bank Mestika Dharma, Bank KB Bukopin, Allo Bank Indonesia, Bank Central Asia, Bank Capital Indonesia, Bank MNC Intenasional, Bank Jago, Bank Amar Indonesia, Bank IBK Indonesia, Bank Raya Indonesia.

Operational Definition of Variables

Net Interest Margin (NIM) is the difference between interest income and interest costs divided by interest on asset profits [3].

NIM = Interest Income – Interest Expenses

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Asset Profit Interest

Ownership Structure (OS) is the percentage of managerial ownership of bank. Ownership structure using decimal scale .

Financial Technology, Fintech, is the percentage of adoption on financial technology in the bank. Fintech using decimal scale.

Method of collecting data

The data collection method in this research is to emphasize documentation and literature study, because the information obtained is not directly from the object being studied, but comes from literature that is related to the problem to be studied. The data used includes journals, reference and introductory books, the Indonesian Stock Exchange website [25], the official pages of related companies, and also other relevant sources.

Data analysis method

In this research, the data analysis methods used are multiple linear regression analysis, classical assumption test, descriptive statistics, t test, and F test. The data in this research will later be processed by carrying out statistical tests using the IBM SPSS 20 application program.

Test of classical assumptions

Test of classical assumptions is used to see if the data obtained and used in this research contains the symptoms of classical assumptions to get good research results and conclusions. The classical hypothesis test tests are normality test, heteroskedasticity test, multicollinearity test and autocorrelation test [24]. This study uses the Kolmogorov-Smirnov (K-S) test as a standard of normality. Decision making and hypothesis are as follows: $H_0$: No normal distribution. Ha: Normal distribution If the probability value is less than $< 0.05$ so that $\rightarrow$ $H_0$ is rejected If the probability value is more than $> 0.05$ $\rightarrow$so that $H_0$ is accepted in this study, testing for heteroscedasticity was performed by entering the resabs variable into the regression model. The decision and hypothesis are:$H_0$: Symptoms of heteroscedasticity are present Ha: There are no symptoms of heteroskedasticity in the model If the probability value is less than $< 0.05$ so that $\rightarrow$ $H_0$ is rejected. If the probability value is more than $> 0.05$ so that $\rightarrow$ $H_0$ is accepted. To determine if there is autocorrelation in the regression model, testing is done using the Durbin-Watson test (DW test). The decision criteria are -2 to +2. To find out whether or not there is multicollinearity in a regression model, perform a correlation test between the independent variables by looking at the VIF and tolerance values. The criteria are VIF less than 10 and Tolerance less than 0.10 .Multiple regression analysis is used as a data analysis technique because there is more than one independent variable in this study. Multiple regression analysis is a testing method used to determine the effect of an independent variable on a dependent variable. The multiple linear regression equation is

$Y_{NIM} = \alpha + ß_1 \text{Fintech} + ß_2 \text{OS} + ß_3 \text{FinStruc} + e$

Keterangan :

Y Nim = Variable Dependent of Net Interest Margin

α        = Constanta

β        = Coeficient Variable Independent

Fintech = Financial Technology

OS = Ownership Structure

FinStruc = Interaction between Fintech*Ownership Structure

e        = eror

Hypothesis testing

Hypothesis testing aims to determine whether the hypothesis used in research is accepted or rejected. Hypothesis testing consists of three types, namely the statistical F test, the coefficient of determination test (R2), and the t test. The following are the three types of hypothesis testing:

a. Analysis of Variance (ANOVA)/ Statistical F Test

The F test is used to determine the influence of the significance of independent variables simultaneously on the dependent variable. The degree of significance of trust used in this research is 0.05. If the calculated F value is greater than the table F value, then all independent variables simultaneously have a significant effect on the dependent variable. Or if the significance value of the independent variable on the dependent variable is less than 0.05 then the independent variable has a significant effect on the dependent variable.

b. Coefficient of Determination (R2) or R Square

The Coefficient of Determination Test shows how much the independent variable can influence or explain the dependent variable used in the research. If the value of Adj. $R^2$ is almost close to 1, meaning the independent variable can explain almost all the information needed to predict the dependent variable. Meanwhile, if the value of Adj. $R^2$ is small or close to 0, meaning the ability of the independent variable to explain the dependent variable is low [24].

c. Statistical t test

The T test is used to determine the partial influence of the significance of independent variables on the dependent variable. This test was carried out using a significance level of 0.05 ($\alpha$=5%). The decision-making criteria are as follows:

1) If the probability value is <0.05, then Ha is accepted and H$_0$ is rejected, meaning that partially there is a significant influence.

2) If the probability value is > 0.05, then Ha is rejected and H$_0$ is accepted, meaning that partially there is no significant influence

## 4. FINDING AND DISCUSSION

**Table 1 Descriptive Statistics**

|  | Mean | Std. Deviation | N |
|---|---|---|---|
| nim | 5.0903 | 3.57893 | 70 |
| Fintech | 73.7143 | 35.47489 | 70 |
| OS | 19.2760 | 30.39730 | 70 |
| Finstruc | 1828.0429 | 2834.70344 | 70 |

Source : (SPSS,2023).

Table 1 explains that the number of observations is 70 financial report data for 2017-2021 from the fourteen samples of Conventional Bank in Indonesia Stock Exchange. The average NIM is 5.9, fintech adoption is 73.7, ownership structure (OS) is 19.2 and Fintech moderation*ownership structure (FinStru) is 1828.

**Table 2** Test of Kolmogorov-Smirnov

|  |  | nim |
|---|---|---|
| N |  | 70 |
| Normal Parameters[a,b] | Mean | 5.0903 |
|  | Std. Deviation | 3.57893 |
| Most Extreme Differences | Absolute | .154 |
|  | Positive | .154 |
|  | Negative | -.092 |
| Kolmogorov-Smirnov Z |  | 1.289 |
| Asymp. Sig. (2-tailed) |  | .072 |

Source : SPSS (2023)

**Table 3** Gletjser Test

| Model |  | Unstandardized Coefficients | | t | Sig. |
|---|---|---|---|---|---|
|  |  | B | Std. Error |  |  |
| 1 | (Constant) | 1.103 | .174 | 6.347 | .000 |
|  | fintech | -.437 | .233 | -1.876 | .065 |
|  | OS | 2.944 | 2.079 | 1.416 | .161 |
|  | finstru | -3.335 | 2.252 | -1.481 | .143 |

Dependent: abs_res

Based on Table 3 Gletjser Test that the significance of ownsrship structure (OS) is 0,161 more than 0,05, fintech is 0,65 more than 0,05 and The interaction of Fintech and ownership structure (Finstru) is 0,143 more than 0,05. The Heteroskedastisity test is accepted.

**Table 4** Test of Autocorrelation

| Durbin-Watson | Criteria | Note |
|---|---|---|
| .794 | -2 s.d. +2 | Accepted |

Table 4 explains that the DW value is 0.794, meaning that the data is free from correlation so that the data passes the autocorrelation test. The DW value used is -2 to +2 [24].  .

**Tabel 5** Test of Multikolonieritas

| Variable | Collinearity Statistics | |
|---|---|---|
|  | Tolerance | VIF |
| Fintech | .813 | 1.231 |
| Struc | .014 | 71.857 |
| FinStruc | .014 | 73.304 |

Table 5 explains that the Tolerance and VIF values are used for the Multicollinearity test where the results show that all VIF value variables are greater than 10 while the tolerance value is smaller than 0.10.

**Tabel 6 Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .527[a] | .277 | .244 | 3.11086 | .794 |

a. Predictors: (Constant), FinStruc, Fintech, Ownstru

b. Dependent Variable: nim

Table 6 of the coefficient of determination shows that the adjusted square value is 0.244, meaning that 24.4% of the fintech variables, ownership structure and interaction between fintech and ownership structure have an effect on NIM.

**Tabel 7 ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 245.092 | 3 | 81.697 | 8.442 | .000[b] |
| | Residual | 638.712 | 66 | 9.677 | | |
| | Total | 883.804 | 69 | | | |

a. Dependent Variable: nim

b. Predictors: (Constant), FinStruc, Fintech, Ownstructur

Table 7 shows that simultaneously Fintech, Ownership Structure and Moderation of Ownership Structure and Fintech are able to have a significantly positive effect on net interest margin (NIM). The F number is 8.442 and the significance number is 0.000, which is less than 5%, so the hypothesis is accepted.

**Table 8 Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 8.743 | .873 | | 10.017 | .000 | | |
| | Fintech | -.052 | .012 | -.519 | -4.470 | .000 | .813 | 1.231 |
| | OwnStruc | -.271 | .104 | -2.303 | -2.596 | .012 | .014 | 71.857 |
| | FinStruc | .003 | .001 | 2.353 | 2.627 | .011 | .014 | 73.304 |

a. Dependent Variable: nim

The results of the regression equation are as follows:

$$Y_{nim} = 8.743 - 0.519 \text{ adoption} - 2.303 \text{ OS} + 2.353 \text{ Finstruc} + e$$

Based on table 8 , The t test results show that:

a) Fintech adoption has a significance figure of 0.000 and a beta of -0.519, so it is significantly negative for NIM. The higher the adoption of fintech, the lower the NIM.

b) Ownership structure (OS) has a significance number of 0.000 and beta -2.303, so ownership structure has a significant negative effect on NIM. The higher the ownership structure, the lower the NIM.

c) The Moderation Fintech*structure interaction has a significance figure of 0.000 and beta 2.353, so the Fintechstructure interaction has a significant positive effect on NIM. The higher the interaction between Fintech and structure can be the higher the NIM.

Discussion

1.Fintech adoption has a significant negative effect on net interest margin. Fintech implemented by companies can reduce the NIM obtained by banks. Fintech creates efficiency so that the interest margin earned becomes smaller. Empirical support is Fintech and nim [4] and Fintech has a significant impact on NIM performance [21]. The number of fintech borrowers on the scale of micro and small businesses is closely related to the interest rates on loans from fintech [23].  The hypothesis (H1) is accepted.

2. Ownership structure can have a negative effect on net interest margin. The ownership structure of investors can influence the decline in NIM. The percentage of investors' shares can cause the bank's margin to decrease because the policies taken by the company can reduce NIM earnings. Empirical support for ownership structure related to NIM [22]. Ownership structure can influence margin performance. The hypothesis (H2) is accepted.

3. Ownership structure can moderate fintech adoption on net interest margin. The ownership structure of investors is able to strengthen the influence of fintech on NIM. The number of investors' shares in the company can drive the influence of fintech on NIM. Investor policies can strongly influence the influence of fintech on bank NIM acquisition. Empirical support for credit distribution in fintech [22]. The hypothesis (H3) is accepted.

## 5.   CONCLUSION

Financial Technology , ownership structure and the interaction of Fintech and ownership structure simultaneously significant on net interest margin. Fintech adoption has a significant negative effect on net interest margin. Ownership structure can have a significant negative effect on net interest margin. Ownership structure can moderate fintech adoption on net interest margin.

Suggestion such as Bank management can apply fintech to reduce high interest costs. Bank management can pay attention to the ownership structure to implement a low net interest margin. Investors can pay attention to their share of ownership in the use of fintech within banks in order to maintain a stable net interest margin. Further research can add other variables that can influence banking NIM in Indonesia such as macro economic factors and Bank Indonesia Rate. The number of research samples can be expanded to include banks in Indonesia so that the NIM of banks in Indonesia can be fully understood.

The Implication of this research that the results can conduct the information for investor dan management of bank to improve the used of Financial Technology on gaining net interest margin. This research can give impact for the Stakeholder of Bank to protect net interest margin bank with effected variables.

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