Indonesian Journal of Economics, Management, and Accounting
Vol. 2, No. 7, Juli 2025
Hal 2037-2045
E-ISSN : 3032-0550
P-ISSN : 3032-1891
Site: https://jurnal.intekom.id/index.php/ijema

The Effect of Reference Interest Rates And Financial Technology on Bank Intermediation Performance (Case Study of Bank Mandiri)

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Article Info

Article history:

Received Juli 3, 2025
Revised Juli 6, 2025
Received Juli 6, 2025

Kata Kunci:

BI-Rate,
Financial Technology,
Net Interest Margin,
Loans,
QRIS

Keywords:

BI-Rate,
Financial Technology,
Net Interest Margin,
Loans,
QRIS

ABSTRACT

Penelitian ini bertujuan untuk menguji pengaruh suku bunga acuan (BI-Rate) dan teknologi finansial (fintech) terhadap kinerja intermediasi Bank Mandiri yang diukur dengan Net Interest Margin (NIM). Latar belakang penelitian ini adalah perubahan BI-Rate dan pesatnya pertumbuhan fintech yang dapat memperkuat atau memperlemah peran intermediasi bank konvensional. Metode yang digunakan adalah pendekatan kuantitatif dengan Error Correction Model (ECM) dan analisis regresi linier berganda, dengan menggunakan data sekunder tahun 2021–2024 yang bersumber dari Bank Indonesia dan Bank Mandiri. Hasil penelitian menunjukkan bahwa BI-Rate dan penyaluran kredit berpengaruh signifikan terhadap NIM, baik dalam jangka pendek maupun jangka panjang. Fintech yang ditunjukkan dengan nilai transaksi QRIS dan Kopra oleh Mandiri juga berpengaruh signifikan terhadap NIM, meskipun dengan cara yang berbeda. Penelitian ini menyimpulkan bahwa suku bunga acuan berpengaruh negatif terhadap NIM, sedangkan teknologi finansial dapat meningkatkan efisiensi dan mendukung keberlangsungan intermediasi. Bank Mandiri dapat mempertahankan kinerja intermediasi yang kuat dengan menggunakan strategi digital yang beradaptasi dengan perubahan suku bunga dan kemajuan teknologi keuangan.

ABSTRACT

This study aims to examine how the benchmark interest rate (BI-Rate) and financial technology (fintech) influence Bank Mandiri's intermediation performance, measured by Net Interest Margin (NIM). The background of this study is based on the changes in the BI-Rate and the fast growth of fintech, which could either strengthen or challenge the intermediation role of traditional banks. The method used is a quantitative approach with the Error Correction Model (ECM) and multiple linear regression analysis, relying on secondary data from 2021–2024 sourced from Bank Indonesia and Bank Mandiri. The results indicate that the BI-Rate and loans given have a significant impact on NIM, both in the short and long term. Fintech, shown by the transaction value of QRIS and Kopra by Mandiri, also significantly affects NIM, though in different ways. This study concludes that the benchmark interest rate negatively affects NIM, while financial technology can improve efficiency and support the continuation of intermediation. Bank Mandiri can maintain strong intermediation performance by using a digital strategy that adapts to changes in interest rates and advances in fintech.

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1. INTRODUCTION

In the banking sector, Net Interest Margin (NIM) is one of the important indicators in assessing the financial performance of banks. Net Interest Margin is an important indicator that shows how much profit margin a bank generates from the difference between interest income from loans and interest expenses paid to savers or lenders. Banks that have a high NIM are usually considered more efficient in generating profits from lending activities [1]. According to OJK, the minimum NIM standard set for banks in Indonesia is 6%. This indicates that banks need to generate sufficient interest income to cover costs and provide returns to shareholders as well as maintain their financial health [2].

Changes in overall economic conditions have significantly affected the dynamics of NIM in Indonesian banking, including Bank Mandiri, one of the leading banks in the country. One important step that can be taken is to focus on external factors such as macroeconomic conditions in influencing Bank Mandiri's NIM. Fluctuations in benchmark interest rates have a direct impact on the cost of funds and lending rates [3]. The BI interest rate is the amount of money that must be paid by the borrower to the lender for a certain amount of money to finance consumption and investment [4]. Therefore, changes in the BI rate can affect the amount of bank interest income, which in turn has an impact on NIM. If the BI rate rises, then lending rates also tend to rise, which could suppress loan demand and potentially reduce banks' interest income.

Loans are the main source of interest income for Bank Mandiri, so effective management of these loans will greatly affect the bank's Net Interest Margin (NIM). Along with the increasing number of loans disbursed, it is important to analyze how the quality of these loans affects the bank's financial performance. Good credit quality can improve operational efficiency and keep NIM stable, even in volatile market conditions [5]. Conversely, non-performing loans can reduce asset quality and affect interest income, which in turn has a negative impact on NIM. The importance of adaptation to technological developments in lending, so that banks remain competitive and can maintain optimal NIM [6].

In addition to monetary factors, the rapid growth in financial technology or *fintech* has also changed the way banks operate as intermediary institutions. Fintech makes payment systems tend to be easier and safer [7]. Financial technology (fintech) supports banking performance in payment systems, market support, investment management and risk management, lending, financing, capital provision, and other financial services [8]. The rise of fintech presents both challenges and opportunities for banks. On the one hand, *fintech* can improve operational efficiency, expand access to financial services, and help digitally transform banking. On the other hand, fintech can also take over part of the banking market share related to lending and financial services, which can ultimately reduce net interest margins. In Indonesia, BI continues to encourage the use of fintech with cashless payment and introduce payment technology innovations that are efficient and safe for the public [9].

Bank Mandiri, as one of the largest state-owned banks in Indonesia, is also affected by this change. In recent years, Bank Mandiri has taken many steps towards digitalization to face the fintech

challenge, such as creating a digital banking application and collaborating with several fintech companies. However, the rapid growth of independent *fintech* and changes in the benchmark interest rate still pose risks to the stability of the Net Interest Margin (NIM), which is important for Bank Mandiri's performance in lending. This situation highlights the need for a detailed analysis of how the BI-Rate and fintech growth affect NIM, both individually and together.

Bank Mandiri as one of the largest banks in Indonesia has an important role in this NIM phenomenon. Bank Mandiri is one of the largest state-owned banks in Indonesia which officially started operating on October 2, 1998, called PT Bank Mandiri (Persero). PT Bank Mandiri (Persero) was established as part of the banking restructuring program implemented by the Indonesian government . In July 1999, Bank Mandiri was a bank in Indonesia resulting from the merger of four government banks, namely Bank Bumi Daya, Bank Dagang Negara, Bank Ekspor Impor Indonesia , and Bank Pembangunan Indonesia, where each bank has an inseparable role in the development of the Indonesian economy. Until today, Bank Mandiri continues the tradition of more than 140 years of contributing to the world of banking and the Indonesian economy.

Table 1. Profitability of Bank Mandiri

Profitability	***Net Interest Margin* (NIM)**
2024	4.93%
2023	5.25%
2022	5.16%
2021	4.73%

Source: Bank Mandiri Annual Financial Report *www.bankmandiri.co.id*

Based on the Bank Mandiri profitability report data above, it can be seen that *the Net Interest Margin* (NIM) increased from 2021 to 2022 with an increase of 0.43% from 4.73% to 5.16%, in 2022 to 2023 it also increased by 0.09% from 5.16% to 5.25%, but in 2023 to 2024 it decreased by 0.32% from 5.25% to 4.93%.

The main question is whether the change in the benchmark interest rate and the rise *of fintech* significantly affect Bank Mandiri's credit distribution performance. In addition, it is still unclear how financial technology can strengthen or disrupt the role of bank lending, especially in traditional banking. The lack of a comprehensive study on the relationship between these factors at Bank Mandiri makes this topic important for academic research. Thus, this study is needed to provide a clearer understanding of how benchmark interest rates and financial technology affect bank lending performance. The results of this study are expected to provide valuable insights for bank leaders and regulators in making policies that adapt to economic changes and digital disruption in the financial sector.

2. METHOD

Models that incorporate adjustments to correct for imbalances are called *Error Correction Models* (ECM). The main use of ECM models is to overcome the problem of non-stationary *time series data* and the problem of spurious regression. Non-stationary data tends to have an imbalanced relationship in the short term, but there is a tendency for a long-term equilibrium relationship [10]. The data used in this study is secondary data. Secondary data is primary data that has been further processed. The data source comes from the bi.go.id website and Bank Mandiri's annual financial report published through Bank Mandiri's official website and other relevant sources, for example in the form of tables.

Table 2. Data and Data Sources

Variables	Period	Unit	Data source
Net Interest Margin of Bank Mandiri	Month	Percentage	Bank Mandiri website *www.bankmandiri.co.id*
BI Rate	Month	Percentage	Bank Indonesia website www.bi.go.id
Credit Given	Month	Rupiah	Bank Mandiri website *www.bankmandiri.co.id*
QRIS Bank Mandiri	Month	Rupiah	Bank Mandiri website *www.bankmandiri.co.id*
Kopra by Mandiri	Month	Rupiah	Bank Mandiri website *www.bankmandiri.co.id*

The data taken includes information related to independent variables, namely BI-Rate, Credit Given, QRIS Mandiri, *Kopra by Mandiri* and the dependent variable, namely *Net Interest Margin* (NIM). This study searches for data online on the Bank Indonesia website, namely BI-Rate data and the Bank Mandiri website, namely Net Interest Margin data at Bank Mandiri, data on the value of Credit Given, data on the value of QRIS Mandiri transactions, and data on the value of Kopra by Mandiri transactions. According to Engle-Granger (EG), if two variables Y and X are not stationary but cointegrated, then the relationship between the two can be explained by the ECM model [10].

Thus, a general model in econometric equations can be constructed:

$$\Delta(NIM_t) = \beta_0 + \beta_1 \Delta BIR_t + + \beta_2 \Delta CREDIT_t + \beta_3 \Delta QRM_t + \beta_4 \Delta KPM_t + \varepsilon t$$

Information

NIM = *Net Interest Margin* (Percent)
BIR = BI-Rate (Percent)
CREDIT = Value of Credit Given (Rupiah)
QRM = Mandiri QRIS Transaction Value (Rupiah)
KPM = Kopra Transaction Value *by Mandiri* (Rupiah)
B_0 = Regression Constant
B_1, β_2, β_3, β_4 = *Slope* coefficient
t = 1, 2, ..., n, indicates the time series dimension
ε = Error Term

3. RESULTS AND DISCUSSION

3.1 Level Stationarity Test Results

Table 3. Results of the Level Stationarity Test

Variables	ADF t-statistic value	MacKinnon's Critical Values			Prob	Information
		1%	5%	10%		
logNIM	-1.032560	-4.180911	-3.515523	-3.188259	0.9287	Not Stationary
logBIR	-1.895847	-4.170583	-3.510740	-3.185512	0.6405	Not Stationary
logCREDITS	-0.674194	-4.165756	-3.508508	-3.184230	0.9692	Not Stationary
logQRM	-3.401326	-4.284580	-3.562882	-3.215267	0.0696	Stationary
logKPM	-6.550171	-4.226815	-3.536601	-3.200320	0.0000	Stationary

Source: Data Processing Results with *Eviews* 13

The results of the stationary test at the level level still have variables that are not stationary, so a unit root test is conducted at the first difference level.

Table 4. Results of the First Difference Level Stationarity Test

Variables	ADF t-statistic value	MacKinnon's Critical Values			Prob	Information
		1%	5%	10%		
logNIM	-18.48369	-4.175640	-3.513075	-3.186854	0.0000	Stationary
logBIR	-3.301043	-4.170583	-3.510740	-3.185512	0.0788	Stationary
logCREDITS	-7.204643	-4.170583	-3.510740	-3.185512	0.0000	Stationary
logQRM	-9.512947	-4.186481	-3.518090	-3.189732	0.0000	Stationary
logKPM	-4.396467	-4.175640	-3.513075	-3.186854	0.0056	Stationary

Source: Data Processing Results with *Eviews* 13

Since all p-values are below the 5% significance level (α = 0.05), all variables have met the criteria for stationarity at the first-difference level. Thus, the prerequisite to conduct further analysis using the Error Correction Model (ECM) approach has been met.

3.3 Cointegration Test

Table 5. Cointegration Test Results

Variables	Coefficient	Std. Error	t-statistic	Prob	R^2
C	5.537432	2.281560	2.427037	0.0196	0.506236
logBIR	0.260319	0.055293	4.708026	0.0000	
logCREDITS	-0.271456	0.123621	-2.195871	0.0337	
logQRM	-0.292498	0.339268	-0.862145	0.3935	
logKPM	0.326881	0.358555	0.911662	0.3672	

Source: Data Processing Results with *Eviews* 13

The results of the cointegration test equation are as follows:

$$logNIM_t = 5.5374 + 0.2603logBIR_t - 0.2714logCREDIT_t - 0.2924logQRM_t + 0.3268logKPM_t$$

From the equation above, the residual value will be obtained. Then this residual value will be tested using the Augmented Dickey-Fuller test to determine whether the residual value is stationary or not. With the testing criteria if in the cointegration test the ADF t-statistic value <critical value, then all research variables are cointegrated or have a long-term relationship. The results of the Augmented Dickey-Fuller test can be seen in the following table:

Table 6. Results with the EG Method at the Level Test

Variables	ADF t-statistic	Critical Value			Prob	Conclusion
		1%	5%	10%		
Residue	-4.354322	-4.243644	-3.544284	-3.204699	0.0076	Cointegrated

Source: Data Processing Results with *Eviews* 13

Based on the table above, the results of the cointegration test with Engle-Granger through the ADF method for *the Unit Root Test* on the residue show that the ADF t-statistic value of -4.354322 is greater than the critical value or critical value at the 5% level and is also supported by a probability value that is smaller than a = 0.05, then the residual of the regression equation is stated to be stationary at the level level.

3.4 *Error Correction Model* (ECM) Regression Results

Table 7. ECM Test Results

Variables	Coefficient	Std. Error	t-statistic	Prob	R^2
C	0.011162	0.017760	0.628489	0.5333	0.659108
logBIR	0.388215	0.157205	2.469486	0.0180	
logCREDITS	-1.001321	0.451014	-2.220157	0.0323	
logQRM	-1.002209	0.288794	-3.470329	0.0013	
logKPM	0.924209	0.558680	1.654272	0.1061	
ECT	-1.047772	0.160228	-6.539255	0.0000	

Source: Data Processing Results with *Eviews* 13

Based on the results of data processing, the t-statistic value for the ECT variable is -6.539255. This value is greater than the t-table value of 1.6449 at a 5% confidence level and df (*degree of freedom*) nk-1 (48-4-1) of 43. So it can be concluded that the ECT variable in the short term has a significant negative effect on Bank Mandiri's *Net Interest Margin*.
The regression results of the error correction model approach (Engle-Granger *Error Correction Model*) in the table can be rewritten in the equation below:

$$logNIM_t = 0.011162 + 0.388215logBIR_t - 1.001321logCREDIT_t - 1.002209logQRM_t + 0.924209logKPM_t - 1.047772ECT$$

The ECT coefficient value is negative and statistically significant, meaning that the Engle-Granger ECM specification model used in this study is valid. The ECT coefficient value = 1.047772 means that the difference between the actual value of *Net Interest Margin* and its equilibrium value of 1.047772 will be adjusted within one month [10].

3.5 Results of the Classical Assumption Test

3.5.1 Normality Test

Table 8. Normality Test Results

Jarque-Bera	*Chi-Square* Table	Information
2.208013	9.4877	Normally Distributed

Source: Data Processing Results with *Eviews* 13

Based on the table above, it can be seen that the JB value of 2.208013 is smaller than *the Chi-square* table on *df* 4 and a confidence level of 5%, namely 9.4877. So it can be concluded according to the normality test criteria that in this study the assumption of normally distributed residuals is met.

3.5.2 Multicollinearity Detection

Table 9. Multicollinearity Detection Results

Independent Variable	VIF	Information
logBIR	1.189122	Low Multicollinearity
logCREDITS	1.219423	Low Multicollinearity
logQRM	1.655272	Low Multicollinearity
logKPM	1.495562	Low Multicollinearity
ECT	1.317105	Low Multicollinearity

Source: Data Processing Results with *Eviews* 13

The table above shows the results of multicollinearity detection in this research model which shows that all independent variables, namely BI-Rate (BIR), Credit Given (CREDIT), QRIS Bank Mandiri (QRM), and *Kopra by Mandiri* (KPM) are in accordance with the multicollinearity detection criteria using the VIF <5 method so that it is stated that multicollinearity is low or it can be considered that there is no multicollinearity problem.

3.5.3 Heteroscedasticity

Table 10. Heteroscedasticity Results

Obs*R-Squared	***Chi-Square* Table**	**Information**
4.678694	9.4877	Homoscedasticity

Source: Data Processing Results with *Eviews* 13

Based on the table above, we can see the *Obs*R-Squared value* of 4.678694 is smaller than the chi-square table on df (4) and the 5% significance level of 9.4877. So according to the heteroscedasticity test criteria, it can be concluded that there is no heteroscedasticity problem in this research model.

3.5.4 Autocorrelation Test

Table 11. Autocorrelation Test Results

Obs*R-Squared	***Chi-Square* Table**	**Information**
5.750202	9.4877	No Autocorrelation

Source: Data Processing Results with *Eviews* 13

Based on the table above, we can see the *Obs*R-Squared value* of 5.75202 is smaller than the chi-square table on df (4) and the 5% significance level is 9.4877. So according to the autocorrelation test criteria, it can be concluded that there is no autocorrelation problem in this research model.

3.6 Hypothesis Testing

3.6.1 t-Statistic Test

The Influence of Independent Variables on Dependent Variables in the Short Term

Table 12. Results of the t-Statistic in the Short Term

Variables	**t-statistic**	**t-table**	**Prob**	**Conclusion**
logBIR	2.469486	1.6449	0.0180	Significant
logCREDITS	-2.220157	1.6449	0.0323	Significant
logQRM	-3.470329	1.6449	0.0013	Significant
logKPM	1.654272	1.6449	0.1061	Significant
ECT	-6.539255	1.6449	0.0000	Significant

Source: Data Processing Results with *Eviews* 13

The Influence of Independent Variables on Dependent Variables in the Long Term

Table 13. Results of the t-Statistic in the Short Term

Variables	t-statistic	t-table	Prob	Conclusion
logBIR	4.708026	1.6449	0.0000	Significant
logCREDITS	-2.195871	1.6449	0.0337	Significant

logQRM	-0.862145	1.6449	0.3935	Not Significant
logKPM	0.911662	1.6449	0.3672	Not Significant

Source: Data Processing Results with *Eviews* 13

3.6.2 F-Statistic Test

Short-Term F-Statistic Test Results

Table 14. Results of the F-Statistic in the Short Term

DF (k- 1 ; nk-1)	α	F-statistic	F-table	Conclusion
3;43	5%	15.08115	2.84	Significant

Source: Data Processing Results with *Eviews* 13

From the table above, it can be seen that the F-statistic is 15.08115. This F-statistic value is greater than the F-table value at a 5% confidence level, which is 2.84. This shows that in this study we reject H_0. It can be concluded that the independent variables in this study such as BI-Rate (BIR), Credit Given (CREDIT), QRIS Bank Mandiri (QRM), and *Kopra by Mandiri* (KPM) in the short term together have a significant effect on *Net Interest Margin* (NIM) at Bank Mandiri.

Long-Term F-Statistic Test Results

Table 15. Results of the F-Statistic in the Long Term

DF (k- 1 ; nk-1)	α	F-statistic	F-table	Conclusion
3;43	5%	10.76522	2.84	Significant

Source: Data Processing Results with *Eviews* 13

From the table above, it can be seen that the F-statistic is 10.76522. This F-statistic value is greater than the F-table value at a 5% confidence level, which is 2.84. This shows that in this study we reject H_0. It can be concluded that the independent variables in this study such as BI-Rate (BIR), Credit Given (CREDIT), QRIS Bank Mandiri (QRM), and *Kopra by Mandiri* (KPM) in the long term together have a significant effect on *Net Interest Margin* (NIM) at Bank Mandiri.

3.6.3 Interpretation of the Determinant Coefficient (R^2)

The coefficient of determination R^2 is used to measure how well the regression line fits the data or to measure the percentage of total variation in Y explained by the regression line. The R2 value ranges from 0 to 1. The closer to 1 the better. In this study, the dependent variable *Net Interest Margin* (NIM) can be influenced in the long term and short term. In the long-term regression results, R2 was obtained at 0.5062, which means that independent variables such as BI-Rate (BIR), Credit Given (CREDIT), QRIS Bank Mandiri (QRM), and *Kopra by Mandiri* (KPM) can explain the *Net Interest Margin* (NIM) variable by 50.62% while the remaining 49.38% is explained by other variables outside the research model. Meanwhile, in the short-term regression, R2 is allowed to be 0.6591, which means that independent variables such as BI-Rate (BIR), Credit Given (CREDIT), QRIS Bank Mandiri (QRM), and *Kopra by Mandiri* (KPM) can explain the *Net Interest Margin* (NIM) variable by 65.91% while the remaining 34.09% is explained by other variables outside the research model.

4. CONCLUSION

This study concludes that the benchmark interest rate (BI-Rate) and financial technology (fintech) have a significant influence on Bank Mandiri's credit distribution performance as measured by the Net Interest Margin (NIM), both in the short and long term. The results of the analysis show that the BI-Rate has a strong positive influence on NIM both in the short and long term, which means that when the

BI-Rate increases, banks can increase credit interest rates faster than deposit interest rates, so that their profit margins also increase.

On the other hand, the amount of credit disbursed has a significant negative effect on NIM, indicating that although credit increases, the risk and cost of credit distribution can reduce net interest income. The financial technology aspect indicated by QRIS transactions has a significant negative effect in the short term but is not significant in the long term on NIM, while Kopra by Mandiri has a significant positive effect in the short term but is not significant in the long term. This indicates that the success of fintech as a credit distribution instrument still depends on how well it is implemented and integrated into the bank's business model.

Overall, Bank Mandiri can maintain its credit distribution performance through a good digital strategy and partnership with fintech. With digital changes such as Livin' by Mandiri and Kopra, as well as monetary policy adjustments through the BI-Rate, Bank Mandiri has shown strong adaptability in maintaining efficiency and profitability. Therefore, to maintain its credit distribution function optimally, ongoing cooperation is needed between monetary policy and improving digital practices in the banking sector.

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