Determinants Of Bank Funding Costs: From Msme Credit Perspective

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Abstract. This research aims to analyse the impact of MSME credit performance, fintech lending, and bank operating costs on banks' funding costs in Indonesia. Bank-level data and aggregate fintech lending growth were collected from secondary sources and analysed using Stata software. A total of 46 commercial banks and using quarterly data from 2018 to 2022. High MSME credit performance and fintech lending significantly increase banks' funding costs. This implies that the growth of fintech lending creates a wave of competition and takes a portion of earnings. Banks tend to incur less funding costs when MSME credit is underperforming. In the enterprise-level analysis, the performance of micro-enterprise credit shows a negative impact. Unfortunately, the study did not find any significant impact on operating costs. Finally, smaller, less capitalised and highly leveraged banks tend to pay more for funding. The research is limited to public data, so the information acquired is on the surface. Further research is required to dig deeper into other factors that can determine bank funding costs. This research contributes to enriching the finance and banking literature. Understanding these findings will consequently allow banks and regulators to evaluate policies and design strategies.

Keywords: competition, efficiency, fintech lending, funding costs, MSME credit performance.

1 Introduction

The role of banks as financial intermediaries is undeniably crucial in the economic and financial system (Allen et al., 2008; Benston & Kaufman, 1996). For this reason, bank sustainability is always a concern in various economic regulations (Barth et al., 2013). Even the health of banks today has to survive criminal attacks (Malik & Islam, 2019), which threaten their liquidity (Bechtel et al., 2023) and profitability (Inegbedion et al., 2020). Financial scientists and researchers have extensively addressed bank health and investigated its determinants (e.g., Ahamed & Mallick, 2019; Köhler, 2015; Schaeck & Cihák, 2014). In practice, banks are faced with a complicated situation where they have to comply with the government's mandate to disburse people's business credit (KUR) for MSMEs. Meanwhile, this credit has lower interest rates and limited collateral (Tambunan, 2018). On the flip side, banks have to keep balancing their risks and earnings (Köhler, 2015). The Bank Indonesia Survey in Quarter I (2022) reported that MSME credit disbursements have continued to increase in the last three years. Nevertheless, a soaring non-performing loan ratio has also accompanied this increase. Banks must continue to adapt to technological and information developments while maintaining liquidity. Bank service innovation is an important indicator

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in banks' competitive advantage today (Chahal & Bakshi, 2015; Distanont & Khongmalai, 2020). Not to mention they have to manage their financial risks and earnings performance. The growth of technology-enabled startup companies with easy credit terms has created a more competitive climate (Thakor, 2020). The Financial Services Authority (OJK) (2022) noted that financial technology (fintech) lending has grown by 70 percent in the last five years with the amount of MSME credit disbursement continuing to increase significantly. The presence of startups in the industry has the potential to threaten the performance of existing businesses (Zhao et al., 2022), although occasionally banks build alliances with fintechs (Hornuf et al., 2021). To that end, the current study will investigate how MSME credit performance, fintech lending, and operating costs affect bank funding costs.

Earlier literature has discussed bank funding costs and investigated its determinants. For example, Kusi & Opoku-Mensah (2017) examined the impact of credit information sharing on bank funding costs in South Africa. They found that quality credit information sharing can reduce information asymmetry and hence reduce bank funding costs. Other empirical literature analyses the relationship between bank solvency and funding costs and suggests two different directions of the relationship. Most researchers argue that an increase in regulatory capital risk as a proxy for bank solvency tends to lower funding costs (see Aymanns et al., 2016; Schmitz et al., 2019, 2017). Refuting their findings, Aldasoro et al. (2022) provide evidence of a positive causality relationship between regulatory capital and bank funding costs, which means regulatory capital can increase funding costs under certain conditions and vice versa. Taking a different context, Levine et al. (2020) investigated the funding cost of banks based on their geographic diversification. They found that geographic diversification facilitated a significant reduction in funding costs. Mensah et al. (2017) inferred a similar finding that sovereign credit ratings play a role in a bank's ability to access funds, which in turn determines the funding risk that the bank has to take. In more recent literature, funding costs are shown to be determined by ESG (environmental, social, and governance) performance (Andrieș & Sprincean, 2023) and bank liquidity risk (Bechtel et al., 2023). Thus, this study attempts to fill the gap by examining other determinants, as, after all, funding costs significantly impact firms' strategic decisions (Balduzzi et al., 2018).

2 Literature Review

Financial and banking literature have provided insights that funding cost is an important concern for any bank for its financial stability (Beau et al., 2014). Funding cost is one of the risks that banks strongly consider in making bank funding decisions (Burgard & Kjaer, 2013). Like any other commercial industry, a bank must finance its activities and absorb the risk of such funding (Craig & Dinger, 2013). This invokes the diseconomies of scale theory that addresses the complexity of bank performance as the growth of bank size (Canback, 2004; Canback et al., 2006; Stimpert & Laux, 2011). This theory explains that large banks (larger asset size) require more funds to operate and thus incur greater costs. Kroszner (2016) reviewed differential funding costs in the banking literature. He classified funding costs into five categories: bond prices and CDS spreads, credit ratings, deposits, equity prices, etc. However, banks' main revenue comes from deposit interest (Drechsler et al., 2021). Therefore, this study takes the perspective of funding costs from deposits.

The diseconomies of scale theory view that differences in bank funding costs are due to varying sizes. If there is a belief that the government will intervene to support large banks, it

may offer lower interest rates to attract uninsured deposits compared to small banks (Jacewitz & Pogach, 2018). Larger banks are probably able to provide cash management and international transaction services that smaller banks do not offer. Since providing such services is costly, banks may increase their deposit rates.

Bank failures are often associated with a high accumulation of non-performing loans (Khan et al., 2020). Jolevski (2017) argues that non-performing loans adversely affect bank profitability by reducing interest income. Therefore, the loan portfolio quality is important in creating bank liquidity (Mdaghri, 2022). Non-performing loans are considered a significant factor that can erode bank profits through provisioning and/or writing off bad debts (Amin et al., 2019). Even protracted credit problems are the beginning of a bank crisis (Ari et al., 2021; Kauko, 2012). Therefore, banks apply strict credit requirements to avoid the risk of default in the future. In fact, banks in Indonesia cannot avoid the government's programme to disburse credits to MSMEs, which are inherently low-interest and high default risk. This high risk allows fewer credits to be collected, so banks have to absorb more losses. As a consequence, banks set lower deposit rates to cover these risks. Based on this logic, the hypothesis is formulated that MSME credit performance affects bank funding costs.

Yoshino et al. (2016) suggest that banks should establish a proper credit rating scheme for small and medium-sized enterprises. However, banks may suffer the adverse effect of eliminating some of their creditworthy customers. Casey & O'Toole (2014) note that MSMEs with bank credit constraints tend to apply for alternative financing or informal lending with easier terms. One of the main targets for MSME credit is fintech lending (Claessens et al., 2018). Fintech lending is a technology-based platform that provides financing to MSMEs. It provides credit with low requirements and often no collateralised assets (Lagarde, 2018). Therefore, these platforms are in high demand by MSMEs that are limited by bank credit. Hornuf et al. (2021) mentioned that startups that grow significantly to dominate the market can influence their industry and create strong competition. Borrowing from Keeley (1990), competition-fragility theory, a highly competitive industry environment can undermine banks with lower market concentration. The significant growth of fintech lending has the potential to take away some of the concentration of banks, which in turn leads to higher funding costs. Thus, the hypothesis is formulated that fintech lending affects bank funding costs.

Bank efficiency is also touted as one of the keys to bank success (Schaeck & Cihák, 2014). In today's globally integrated system, it is imperative for banks to build effective business operations to avoid the risk of collapse. Efficiency of operations is defined as a bank's capacity to reduce operational costs while achieving its objectives through a strategic combination of skilled personnel, efficient processes, and advanced technology (Hassan & Jreisat, 2016). By optimising resource allocation, each firm's business operations can improve the productivity of the services offered (Bhatia et al., 2018). Banks that operate efficiently tend to maintain higher output and service quality levels, ensuring better overall performance than less efficient competitors in the same industry. Thus, wasteful banks try to cover excess expenditures by lowering deposit rates. The final hypothesis is that operating costs affect bank funding costs.

Based on the literature review and the development of the research logic above, the research framework is depicted in Figure 1.

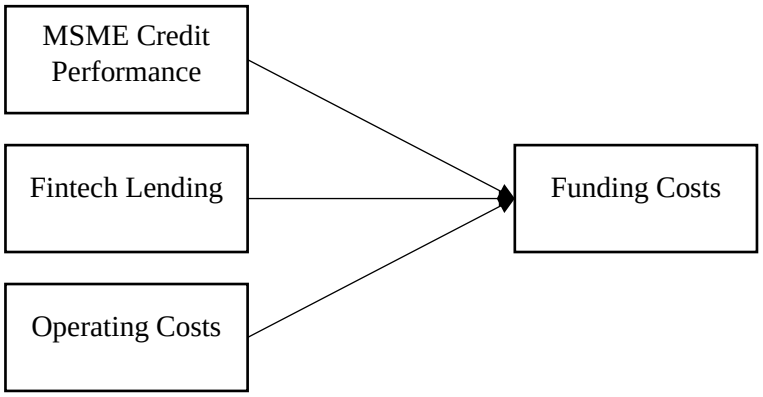

Fig. 1. Conceptual Framework of the Study

3 Method

To examine the logic of this study, panel data at the bank level and aggregate fintech lending growth are used. The research sample is public banks listed on the Indonesia Stock Exchange (IDX). All listed commercial banks are analyzed in this study, and there are 46 banks with quarterly data from 2018 to 2022, totalling 920 observations. The data is documented from bank financial statements and fintech lending statistics from the Financial Services Authority (OJK). The bank-specific variables are collected from publicly published bank financial statements, while fintech lending is documented from OJK statistics. The variables of funding cost, MSME credit performance, and operating cost were calculated independently based on formulas suggested in the literature.

The dependent variable of this study is the cost of bank funding. At the same time, the independent variables include MSME credit performance, fintech lending, and bank operating costs. Each variable is measured using proxies suggested by the available literature. The cost of funding is defined as the level of risk borne by banks on deposits. This variable is calculated by dividing deposit interest expense by total deposits (Dietrich & Wanzenried, 2014; Phan et al., 2020). MSME loan performance reflects the bank's evaluation of the loans it extends to MSMEs. It is calculated by comparing the number of MSME bad credits to total bank credits (Clair, 1992; Inegbedion et al., 2020; Sorge, 2004). Operating costs are considered as a measure of bank efficiency which is calculated by dividing total operating costs by total bank revenue (Dietrich & Wanzenried, 2014; Phan et al., 2020). Finally, fintech lending reflects the growth in the amount of financing disbursed by fintech lenders (Nguyen et al., 2021). This study also considers bank specifications as control variables in the model, including bank size (SIZE), leverage (LEV), and bank capital (CAP). SIZE is the natural logarithm of total bank assets; LEV is calculated from the ratio of total liabilities to total bank assets; and CAP is measured from the ratio of total equity to total bank assets. Detailed variable definitions and measurements are shown in Table 1.

The panel data was analysed using Stata to run robust fixed effects regression. This study also analyses the effect of MSME credit performance at the enterprise level (micro, small, medium, and overall). The general specification of this research model is as follows.

$$FC_{i,t} = \beta_0 + \beta_1 NPL_{i,t} + \beta_2 FINTECH_t + \beta_3 CTI_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 CAP_{i,t} + \varepsilon_{i,t}$$

Where subscript i signifies the cross-sectional dimension (bank), $i = 1 \ldots N$; t signifies the time series dimension (year), $t = 1 \ldots T$; β_0 is the regression intercept; $\beta_{1,\ldots 6}$ is the slope of each independent variable; $FC_{i,t}$ is the funding cost of bank i in year t; $NPL_{i,t}$ is the MSME credit performance of bank i in year t; $FINTECH_t$ adalah fintech lending growth in year t; $CTI_{i,t}$ is bank i's operating expenses in year t; $SIZE_{i,t}$ is the size of bank i in year t; $LEV_{i,t}$ is the leverage of bank i in year t; $CAP_{i,t}$ is the capitalisation of bank i in year t; dan $\varepsilon_{i,t}$ is error term.

Table 1. Operational Definition of Research Variables

Variable	Definition	Measurement	Reference
Dependent variable			
Costs of funding (FC)	The risk that banks take from deposits	Interest expense to total deposits ratio	Dietrich & Wanzenried (2014); Phan et al. (2020)
Independent variables			
MSME credit performance (NPL)	Evaluation to determine the bank's credit quality	Non-performace loan (NPL) ratio is the ratio between the number of bad credits of MSMEs and the total credits of the bank as a whole.	Clair (1992); Sorge (2004); Inegbedion et al. (2020)
Fintech lending (FINTECH)	Financing growth is distributed by fintech companies to MSMEs	Difference between current year (t) and previous year (t-1) fintech lending financing divided by previous year (t-1) fintech financing	Nguyen et al. (2021)
Operating Cost (CTI)	Implies bank efficiency	The ratio of operating expenses to total bank income	Dietrich & Wanzenried (2014); Phan et al. (2020)
Control variables			
Bank size (SIZE)	Size of bank assets	Natural logarithm of total bank assets	Goddard et al. (2004); Sufian & Habibullah (2009) Terraza (2015); Tang & Bae (2021)
Leverage (LEV)	The proportion of liabilities incurred by the bank over its total assets	Ratio of total liabilities to total assets of the bank	Hutchison & Cox (2007); Goetz (2018); Dalci (2018);
Capitalisation (CAP)	The proportion of equity to total assets held by the bank	Ratio of total equity to total bank assets	Mehran & Thakor (2011); Goetz (2018); Abbas et al. (2019)

4 Results and Discussions

Table 2 shows the summary statistics of the variables and the number of observations in this study. The total number analysed is 920 observations. Banks' funding cost averaged 3.65 per cent of bank deposits but recorded banks with very high interest expense-to-deposit ratios. The funding cost incurred by banks in Indonesia varies from 0.00023 per cent to 82 per cent. In addition, the average operating efficiency of banks in Indonesia is 52.9 per cent, which indicates that banks in Indonesia suffer from high-efficiency problems as their operating expenses are more than 50 per cent of their income. The most efficient operating bank incurs operating expenses of 3.29 per cent of its total income. Bank efficiency ranges from 3.29 per cent to 791 per cent. As reflected in the number of non-performing loans, MSME credit performance showed a high average of IDR 13,722 billion, while the lowest was IDR 4,266 billion. The amount of financing disbursed by fintech lenders within xx years, the least was IDR 10,926 billion, and the most was IDR 224.042 billion. Fintech loans disbursed an average of 55 thousand billion rupiah each year. The average bank in Indonesia has a relatively low asset size (16 per cent), a high proportion of debt to equity (83 per cent), and low capitalisation (18 per cent).

Table 2. Statistical Description of Research Variables

Variable	N	Min	Max	Mean	Std.
NPL MSME (in billion rupiah)	920	4,266.00	28,562.00	13,722.65	4,368.32
Fintech (in billion rupiah)	920	10,926.14	224,042.09	55,986.64	49,288.09
Operating cost (ratio)	920	0.0329995	7.9112846	0.5290738	0.4783792
Funding costs	920	0.0000023	0.8216667	0.0365557	0.0575400
Size (in billion rupiah)	920	63.6370	1,750,994.67	112,263,496.26	236,576,592.54
LnSize	920	11.0609503	21.2834498	16.8701958	1.9952109
Leverage	920	0.0462368	8.2655201	0.8270458	0.2069600
Capitalisation	920	0.0104837	2.2830271	0.1781851	0.1379529

Table 3 shows the results of the robust fixed effects of MSME loan performance, fintech lending, and operating costs on bank funding costs. The analysis starts by regressing each explanatory variable on bank funding cost based on overall MSME credit performance. Model 1 is the main result, while Model 2 involves bank-specific controls in the analysis. Model 1 shows that the coefficient of MSME loan performance (NPL_MSME) is negative and significant. The research hypothesis that MSME credit performance affects bank funding costs is accepted. A high NPL ratio indicates poor credit performance. A high NPL ratio of MSME credits (poor credit performance) leads to low bank funding costs. This finding supports Jolevski (2017) and Amin et al. (2019) that non-performing loans reduce the bank's ability to collect profits because the bank has to cover losses on uncollectible credits. When MSME credit performance declines, banks will experience liquidity problems (Mdaghri, 2022) so they are motivated to cover their losses by lowering deposit rates. This means that the bank spends

less effort on deposits. The bank does this to reduce expenses that will suppress current-year profits.

The negative impact of MSME NPLs on bank funding costs is also found to be consistent when control variables are considered in Model 2. Based on these results, banks that have a high proportion of debt in their equity and low capitalisation tend to incur higher costs to obtain funding. As in the diseconomies of scale theory, banks bear greater costs as they become more complex (Canback, 2004; Canback et al., 2006; Stimpert & Laux, 2011). Banks have to accept the costly consequences of writing off uncollectible loans and look for alternatives to recover their losses. A common strategy is to raise or lower interest rates. When credit performance deteriorates, banks will raise interest rates on subsequent loans and lower interest rates on deposits. Furthermore, this study found that the effect of credit performance on funding cost decreases (albeit very slightly) when banks have large debt and low capitalisation.

The next hypothesis is also proven to be accepted, namely fintech lending has an effect on bank funding costs. The results in Models 1 and 2 show a significant positive effect of fintech lending on bank funding costs. Fintech lending takes some of the concentration of the lending market and potentially threatens banks. This finding is clarified by Keeley (1990) competition theory, that banks accept higher risk when their market concentration decreases due to high competition. This result also supports the conclusion of Nguyen et al. (2021) that fintech lending has an adverse impact on bank profit performance. As fintech lending grows, it captures a large share of the lending market and takes away a portion of banks' revenue, especially loans to MSMEs. MSMEs are the main target of fintech loans because banks often underestimate them. In an earlier study, Casey & O'Toole (2014) found that firms that banks undervalue tend to seek informal financing with easier terms. With all its leniency, fintech lending may attract some bank customers and potential customers. Therefore, banks will raise their deposit rates to regain concentration. The findings also note that the effect of fintech lending on bank funding costs increases when banks have a higher debt ratio and low capitalisation. This is indicated by the increase in the coefficient of FINTECH in Model 2 from Model 1.

Table 3. Fixed Effect Model Robust Standard Error: Effect of MSME Credit Performance, Fintech Lending, and Operating Costs on Funding Costs

Variable	Model 1	Model 2
NPL_MSME	-0.0236***	-0.0213***
	(-7.37)	(-7.32)
FINTECH	81.06***	83.45***
	(19.03)	(20.16)
CTI	-5.025	-6.758
	(-0.35)	(-0.43)
SIZE		-0.233
		(-1.02)
LEV		22.65***
		(3.79)
CAP		-252.7*
		(-2.21)
_CONS	-1755.7***	-1729.2***
	(-12.98)	(-11.94)
OBS	920	920
sigma_u	171.54892	154.72888

sigma_e	214.08953	213.27681
rho	.39101407	.34483232
F stats	130.77	92.96
Prob > F	0.0000	0.0000

t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Unfortunately, the last hypothesis of this study failed to prove that operating costs affect bank funding costs. Models 1 and 2 show that operating costs are insignificant to bank funding costs. This may be because high operating costs do not necessarily mean that banks are incurring losses, so they do not increase or decrease their deposit rates. Although insignificant, the coefficient of CTI is found to be negative and increases when the control variables are included in Model 2. Bhatia et al. (2018) mentioned that optimising resource allocation can improve bank productivity. Resources allocated to maintaining output and service quality can improve the bank's overall performance. However, managing operating costs is critical for bank sustainability (Schaeck & Cihák, 2014).

This study then further examines the effect of MSME credit performance, fintech lending, and operating costs on bank funding costs based on enterprise-level credit performance, namely micro, small, and medium. Overall, the results are consistent with the main findings, with slight differences in micro-enterprise credit performance. Small and medium-sized credit performance is found to have a positive impact on bank funding costs (see Models 5, 6, 7, and 8). High levels of small and medium enterprise NPLs may result in banks reducing their deposit rates, meaning lower funding costs. The effect increases when banks have a high proportion of debt to equity and low capitalisation. The opposite effect is shown in the performance of micro-enterprise credits, where banks incur higher costs for their funding due to the adverse impact of non-performing micro credits. Banks with high microcredit default rates tend to lose trust as they are perceived to have liquidity problems. To regain trust, banks have to offer higher deposit rates (higher cost of funding). However, this effect decreases for banks with smaller sizes, higher leverage, and lower capitalisation. Consistent results are also shown for the effect of fintech lending on bank funding costs. The effect tends to increase for banks that have a larger proportion of debt and low capitalisation. Finally, all control variables are also found to be in line with the initial finding that banks pay more for their funding when they are highly indebted.

Table 4. Fixed Effect Model Robust Standard Error: Regression in Enterprise Level

Variable	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
NPL_MIC	1.552***	0.945*				
	(3.64)	(2.42)				
NPL_SMALL			-4.705***	-4.312***		
			(-5.72)	(-4.85)		
NPL_MED					-0.128	-1.001**
					(-0.39)	(-3.04)
FINTECH	88.22***	89.56***	81.19***	82.78***	78.58***	80.20***
	(18.10)	(18.71)	(19.32)	(20.00)	(16.16)	(16.02)
CTI	-13.50	-15.62	-6.154	-7.461	-15.75	-19.64
	(-0.98)	(-1.10)	(-0.45)	(-0.51)	(-1.11)	(-1.39)
SIZE		-0.565*		-0.145		-0.774**
		(-2.57)		(-0.60)		(-3.44)
LEV		19.64**		14.85*		19.05***
		(3.30)		(2.31)		(3.61)

Variable	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
CAP		-295.5*		-230.5*		-325.8**
		(-2.68)		(-2.08)		(-3.00)
_CONS	-2336.9***	-	-1989.8***	-	-1994.1***	-
	(-14.75)	2075.0***	(-15.19)	1950.6***	(-12.70)	1638.0***
		(-12.12)		(-13.02)		(-9.15)
OBS	920	920	920	920	920	920
sigma_u	137.18942	129.48295	145.32029	131.15705	139.59951	167.89829
sigma_e	222.06599	219.45065	213.45674	213.07217	223.81079	219.42326
rho	.27623315	.25823618	.31669806	.27478664	.28008365	.36928431
F stats	121.22	89.66	131.29	83.82	121.39	127.50
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

t statistics in parentheses; * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

5 Conclusion

The fintech lending market in Indonesia has grown 6-fold in the past decade. Knowing that this platform focuses on financing for micro, small, and medium enterprises (MSMEs), its growth has the potential to provide a substantial challenge for banks, especially to raise funds. This study is motivated to test and analyse the effect of MSME credit performance, fintech lending, and operating costs on banks' funding costs. The analysis documents several important findings. First, MSME credit performance has a positive impact on banks' overall cost of funding. The relationship between the two varies across business levels (micro, small, and medium). The relationship between the two varies across enterprise levels (micro, small, and medium). For small and medium enterprises, it is found that their poor credit performance pressurises banks to reduce funding costs by lowering deposit rates. This is done to cover losses due to non-performing small and medium enterprise credits. However, at the micro level, poor microcredit performance increases banks' funding costs. This effect declines in highly indebted banks. Secondly, growing fintech lending significantly increases banks' funding costs. This finding is in line with the competition theory that fintech lending takes up a large portion of market concentration and creates a fierce competitive climate. As a result, banks lose some of their revenue. To recover their finances, banks have to pay more for their funding. The impact of fintech lending is higher for banks with higher debt proportion and brand capitalisation. Thirdly, this study failed to find the effect of operating costs on funding costs. Lastly, the study found that smaller-sized, less capitalised, and higher-leveraged banks tend to pay more for their funding. These findings imply that synergies between fintech lenders and banks are important to maintain credit market stability in Indonesia. The expansion of tech-savvy service innovations can improve bank performance while helping MSMEs access financing. By understanding these findings, banks and regulators can evaluate policies and design strategies accordingly.

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