

The Influence Of Digital Payment Implementation On Banking Stability In Indonesia (A Study On Conventional Banks In Indonesia Listed On The Indonesia Stock Exchange)

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Abstract.

This study aims to investigate the influence of digital payments on the stability of conventional banks listed on the Indonesia Stock Exchange (IDX). Additionally, the research will delve into the role of banking asset quality and liquidity as control variables that may regulate the relationship between digital payments and financial stability. In examining the relationship between digital payments for MSMEs and financial system stability within the conventional banking system listed on the IDX from 2012 to 2022, the research begins by measuring digital payments and banking system stability. Sampling is conducted using purposive sampling, resulting in a collection of 27 conventional banks. The data analysis method for this research includes descriptive analysis, instrument tests, classical assumption tests, t-tests, F-tests, and hypothesis testing using multiple regression analysis. The research findings indicate that ZScore, return on assets, and return on equity have a positive effect on the stability of conventional banks in Indonesia, using Non-Performing Loans and Loan to Deposit Ratio as control variables. Thus, this study supports and strengthens previous research.

Keywords: Digital payment, banking stability, ZScore, return on asset and return on equity.

I. INTRODUCTION

In this era of advanced technology, the payment system has evolved to the extent that traditional methods, such as manual payments, have been abandoned and replaced with payments through mobile devices, now known as mobile payments or m-payments. The emergence of new payment system models is a result of information technology advancements that enable businesses and customers to communicate with each other. Utilizing these emerging payment systems is one way to address several issues related to managing cash or physical currency. Moreover, these systems enhance transaction security and protect customers from fraud and other violations that commonly occur in current digital payments. Online digitization or digital transactions are phenomena that increase the need and can help address future economic challenges [1], [2]. The COVID-19 pandemic has had numerous effects on the financial and banking industries, alongside the increasing innovation in current payment methods. This is evidenced by the economic growth and indicators of future default risk (NPL). It is shown that bankruptcies and corporate insolvencies will significantly increase by the end of 2021, along with the portion of credit extended that remains unpaid (also known as non-performing loans, or NPLs). Therefore, it is estimated that NPLs will increase in line with the intensifying impact of the COVID-19 crisis on the real economy [1], [3]. Conversely, financial stability is crucial for the real economy of a country. This is a common characteristic of the banking industry and is caused by the increase in credit and its relationship with NPLs [4]. The digitalization of retail payments has the potential to alter the relationship between liquidity and instability, components of financial stability. Banks typically can transform liquid assets into illiquid ones by providing loans to borrowers.

However, banks must ensure that depositors have the ability to withdraw their savings whenever they need them, as the inability to provide liquidity to borrowers can pose liquidity risks to the bank. As evidenced by the proliferation of non-cash payment systems, the demand for cash withdrawals has declined. This suggests that digital payments can directly impact bank instability rather than just addressing liquidity issues [2]. Previous studies indicate that the increase in digital payments can benefit the banking sector in the short term, both in terms of revenue and income stability [5]. This is particularly true due to the float fund regulation that allows banks to earn higher fees from digital payment transactions. However, as banks need to invest in infrastructure to support digital transactions and incur higher costs to compete with digital

transactions provided by financial technology companies, these benefits to banking stability may not be sustainable in the long run. Overall, this research suggests that digital payments enhance the economic system. However, this research has some limitations [2]. For instance, the sample is limited to Islamic banks in Indonesia, and the data period is restricted. This study aims to examine the relationship between digital payments and banking stability among conventional banks listed on the Indonesia Stock Exchange (IDX). Additionally, the research will investigate how asset quality and liquidity function as control variables that can regulate the relationship between digital payments and financial stability. The objective of this study is to provide a more comprehensive insight into the factors influencing the relationship between digital payments and financial stability.

II. METHODS

This research involves conventional banks that have adopted digital payment tools. The sampling was conducted using purposive sampling method by setting the following criteria: 1. Conventional banking companies listed on the Indonesia Stock Exchange, 2. Conventional banking companies listed on the Indonesia Stock Exchange that have actively engaged in digital payment transactions during the period of 2012-2022, 2. Based on the above criteria, 27 conventional banking companies listed on the Indonesia Stock Exchange were obtained from the state-owned enterprise banking companies.

Digital Payment

Digital payments are conducted electronically using information and communication technology. The researcher utilizes variables used by [6], which is one of the few studies attempting to analyze digital payments globally. These variables are employed to measure digitally or electronically based payments. The absolute value of electronic retail payment transactions is not used to calculate the payment penetration ratio in their study. Instead, it serves as a representation of the ratio of penetration levels compared to GDP. Therefore, the payment penetration ratio can be computed by dividing the value of digital payment transactions by GDP.

Banking Stability

The ability of the banking system to withstand economic and financial pressures such as financial crises, economic slowdowns, or other shocks is referred to as banking stability, according to researchers. Efforts to create a banking stability index to measure the financial sector's condition have increased in recent years (Ghosh, 2011). In practice, metrics such as the capital adequacy ratio (CAR), return on assets (ROA), and debt-to-equity ratio (D/E) are typically used to measure banking stability. The adequacy of capital ratios can be considered an indicator of banking financial fragility, indicating the balance sheet's ability to absorb damage [7]. Furthermore, researchers use the Z-Score as a tool to measure banking stability. It has the ability to capture the risk of banking insolvency as well as measure the capital and asset capacity of banks to cope with fluctuations in investment return [2]. In this regard, a higher Z-Score indicates greater stability in the banking sector [2]. Researchers employ the formula from the study [8], where the Z-Score is calculated by adding the ROA with the asset value, then dividing it by the ROA; where ROA is the return on assets ratio, and ROA is the standard deviation of ROA.

Return On Asset

According to research conducted by [9], corporate profitability is the ability of an organization to generate profits, which is typically measured using the Return on Asset (ROA) ratio. In other words, the higher the profitability of an organization, the more likely it is to engage in aggressive tax management.

Return On Equity

According to [10] [11], Return on Equity (ROE) is one of the financial metrics used to measure how effectively a company generates profits from the capital invested by shareholders. It is typically calculated using accounting-based performance metrics, stating the company's net profit divided by common shareholders' equity.

Non Performing Loan

Researchers argue that NPLs indicate the level of credit risk faced by banks or financial institutions. Bank risk increases as losses occur due to increasing delinquent payments from borrowers as the NPLs in the

credit portfolio rise. The equation includes several control variables besides the main variables mentioned earlier. Asset quality and banking liquidity are two factors that affect banking stability. The amount of non-performing loans is calculated by comparing the number of problematic loans to total loans.

Non Performing Loan

According to researchers, LDR is a ratio used in the banking industry to measure how much lending can be provided by a bank compared to the total deposits provided by customers. In this study, the liquidity ratio used is the Loan to Deposit Ratio (LDR). The use of LDR is based on [12], which states that LDR is a ratio that measures the total amount of credit granted compared to the total funds from the public and the bank's own capital used.

III. RESULT AND DISCUSSION

	ZSCORE	ROA	ROE	PPR	NPL	LDR
Mean	0.001108	0.019192	-0.160370	0.359508	0.032121	0.847811
Median	0.001600	0.020000	0.090000	0.375387	0.030000	0.850000
Maximum	0.002800	2.380000	0.390000	0.470181	0.650000	1.630000
Minimum	-0.039500	-0.500000	-65.760000	0.224639	0.000000	0.190000
Std. Dev.	0.003943	0.143100	3.824948	0.070283	0.042600	0.175954
Skewness	-8.709169	15.006000	-17.07127	-0.361025	10.75934	0.871013
Kurtosis	81.53988	251.7248	293.2760	2.240560	151.6835	7.322054
Jarque-Bera	80089.90	776713.9	1057145.	13.58907	279301.7	268.7208
Probability	0.000000	0.000000	0.000000	0.001120	0.000000	0.000000
Sum	0.329047	5.700000	-47.63000	106.7738	9.540000	251.8000
Sum Sq. Dev.	0.004603	6.061406	4330.548	1.462144	0.537164	9.164077
Observations	297	297	297	297	297	297

Fig 1. Descriptive Statistics Table

Based on Figure 1, it presents the summary statistics including the mean, median, maximum, minimum, and standard deviation of each variable data. a. The ZScore variable has a mean value of 0.001108, meaning that on average, the sample companies generate banking stability of 0.1%. The median value of ZScore is 0.00160, the maximum value is 0.00280, representing 0.28% of banking stability by Bank Pembangunan Jabar & Banten, and the minimum value is -0.03950, indicating -3.95% by Bank Jtrust Indonesia in 2020 due to the company experiencing losses of 484 billion. This condition is also impacted by a decrease in net interest margin of -0.22%. b. The Return On Equity (ROE) variable has a mean value of -0.160370, indicating that on average, the companies generate a return on equity of 16.03%, with a standard deviation of 3.824948. The maximum ROE value is 0.390000 held by Bank Rakyat Indonesia in 2013, and the minimum value is -65.76000 held by Bank Jtrust Indonesia in 2016, meaning the average return is still negative because the loss in 2016 amounted to minus 718 billion compared to the capital raised from other liabilities which increased by 200%. c. The Return On Asset (ROA) variable has a mean value of 0.019192, meaning that on average, the companies generate a return on assets of 1.9%, with a standard deviation of 0.143100. The maximum ROA value is 2.380000 held by Bank Woori Saudara Indonesia 1906 in 2017, and the minimum value is -0.500000 held by Bank Bukopin in 2021, this is due to credit distribution restrictions due to NPLs in 2020 amounting to 65% and the closure of several Bukopin units, resulting in reduced assets in 2021. d.

The Loan to Deposit Ratio (LDR) variable has a mean value of 0.847811, meaning that on average, companies have an LDR level of 84.78%, with a standard deviation of 0.175954. The maximum LDR value is 1.630000 held by Bank Tabungan Pensiunan Negara in 2019 due to loans amounting to 141 trillion compared to third-party funds of 86 trillion, and the minimum value is 0.190000 held by Bank Bukopin in 2022 due to credit distribution of only 70 trillion compared to third-party funds raised of 250 trillion. e. The Non-Performing Loan (NPL) variable has a mean value of 0.032121, meaning that on average, companies have an NPL level of 3.21%, with a standard deviation of 0.042600. The maximum NPL value is 0.65000

held by Bank Bukopin in 2020 because Bukopin Bank recorded CKPN of 181 billion with NPL value reaching 500 billion, and the minimum value is 0.0000 held by Bank Central Asia in 2012;2013, Bank Cailal Indonesia in 2013;2014;2022, Bank QNB Indonesia in 2013;2014;2021;2022, Bank Maspion Indonesia in 2012, and Bank Bumi Artha in 2013;2014.

Panel Data Regression Analysis Model 1 (ZScore Proxy): The Influence of Digital Payments on Banking Stability with ZScore Proxy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.35E-05	0.001905	-0.017575	0.9860
PPR	-0.004908	0.002923	-1.678743	0.0444
NPL	-0.002533	0.005336	-0.474717	0.6354
LDR	0.003523	0.001722	2.046040	0.0417
Effects Specification				
Cross-section fixed (dummy variables)				
Root MSE	0.003286	R-squared	0.403335	
Mean dependent var	0.001108	Adjusted R-squared	0.327668	
S.D. dependent var	0.003943	S.E. of regression	0.003466	
Akaike info criterion	-8.396306	Sum squared resid	0.003207	
Schwarz criterion	-8.023202	Log likelihood	1276.851	
Hannan-Quinn criter.	-8.246939	F-statistic	4.008784	
Durbin-Watson stat	1.280760	Prob(F-statistic)	0.000000	

Fig 2. Regression Statistical Test Results

According to the analysis shown in Figure 2, the independent variables Payment Ratio Penetration and Control Variables have an influence on Banking Stability proxied by ZScore with an R-squared of 0.403335, or 40.33%. Meanwhile, the remaining 59.67% is influenced by other variables not discussed in this study. Whether the independent variables significantly influence the dependent variable or not, a simultaneous test, also known as an F-test, is conducted. According to decision-making criteria, if the probability value (F statistic) is less than 0.05, or has a significance level of 5%, then H_0 is rejected. Conversely, if the probability value (F statistic) is greater than 0.05, or has a significance level of 5%, then H_0 is accepted, indicating that the independent variables do not have a significant overall influence on the dependent variable. The results of the simultaneous test are shown in Figure 2 above.

The coefficient values of each variable on the dependent variable are determined through a partial test or t-test. According to the decision-making criteria for the partial test, if the probability value (p-value) is less than 0.05 (has a significance level of 5%), H_0 is rejected, indicating that the independent variable has a significant partial influence on the dependent variable. If the probability value (p-value) is greater than 0.05 (has a significance level of 5%), H_0 is accepted, indicating that the independent variable does not have a significant partial influence on the dependent variable. The partial test result for the payment penetration variable is 0.0444 with a t-value of 0.0444. Since the p-value < 0.05 (significance level of 5%), H_0 is rejected and H_1 is accepted, leading to the conclusion that the payment penetration variable has a significant partial influence on Banking Stability with the ZScore proxy.

Panel Data Regression Analysis Model 2 (ROA Proxy): The Influence of Digital Payments on Banking Stability with ROA Proxy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.040680	0.009400	4.327790	0.0000
PPR	-0.038968	0.015608	-2.496720	0.0131
NPL	-0.489256	0.054448	-8.985747	0.0000
LDR	0.003204	0.007956	0.402741	0.6875
Root MSE	0.140683	R-squared	0.980690	

Mean dependent var	0.019192	Adjusted R-squared	0.980358
S.D. dependent var	0.143100	S.E. of regression	0.020055
Akaike info criterion	-4.960640	Sum squared resid	0.117046
Schwarz criterion	-4.886019	Log likelihood	742.6551
Hannan-Quinn criter.	-4.930767	F-statistic	2955.779
Durbin-Watson stat	0.953425	Prob(F-statistic)	0.000000

Fig 3. Regression Statistical Test Results

According to the analysis conducted in Figure 3, it can be seen that the payment penetration ratio and control variables affect Banking Stability proxied by Return on Asset (ROA) by 0.980690, or 98.06%, rounded. Other variables not examined in this study influence the remaining 1.94%. Whether the independent variables significantly influence the dependent variable or not, a simultaneous test, also known as an F-test, is conducted. The results of the simultaneous test are shown in Figure 3 above. According to decision-making criteria, H_0 is rejected if the probability value (F statistic) is less than 0.05, which is a significance level of 5%. Conversely, if the probability value (F statistic) is greater than 0.05, which is a significance level of 5%, then H_1 is accepted, indicating that the independent variables have a significant influence on both dependent variables together.

The coefficient values of each variable on the dependent variable are determined through a partial test or t-test. According to the decision-making criteria for the partial test, if the probability value (p-value) is less than 0.05 (has a significance level of 5%), H_0 is rejected, indicating that the independent variable has a significant partial influence on the dependent variable. If the probability value (p-value) is greater than 0.05 (has a significance level of 5%), H_0 is accepted, indicating that the independent variable does not have a significant partial influence on the dependent variable. The partial test result for the payment penetration variable shows a t-value of 0.0131. Since the p-value is less than 0.05 (significance level of 5%), H_0 is rejected and H_1 is accepted. The conclusion is that the payment penetration variable has a significant partial influence on banking stability with the ROA proxy.

Panel Data Regression Analysis Model 2 (ROE Proxy): The Influence of Digital Payments on Banking Stability with ROE Proxy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.312951	0.043051	7.269253	0.0000
PPR	-0.342522	0.073350	-4.669687	0.0000
NPL	-2.516139	0.279782	-8.993196	0.0000
LDR	-0.020145	0.036513	-0.551722	0.5816
Root MSE	3.805396	R-squared		0.796167
Mean dependent var	0.076259	Adjusted R-squared		0.786130
S.D. dependent var	0.173298	S.E. of regression		0.080144
Akaike info criterion	-2.160947	Sum squared resid		1.695670
Schwarz criterion	-1.978261	Log likelihood		314.3716
Hannan-Quinn criter.	-2.087655	F-statistic		79.32129
Durbin-Watson stat	0.832832	Prob(F-statistic)		0.000000

Fig 4. Regression Statistical Test Results

From the analysis in Figure 4, it can be seen that the independent variables, namely Penetration Payment Ratio along with Control Variables, influence Banking Stability proxied by ROE by 0.796167 or 79.61% (rounded). Meanwhile, the remaining 20.39% is influenced by other variables not examined in this study. Simultaneous test or F-test is conducted to test whether the independent variables collectively have a significant influence on the dependent variable. According to decision-making criteria, if the probability value (F statistic) is < 0.05 (significance level of 5%), then H_0 is rejected, indicating that the independent variables collectively have a significant influence on the dependent variable.

However, if the probability value (F statistic) is > 0.05 (significance level of 5%), then H_1 is accepted, indicating that the independent variables collectively have a significant influence on the dependent variable. From the results of the simultaneous test in Figure 4 above, it is obtained that the probability value

(F-statistic) is $0.0000 < 0.05$; thus, H_0 is rejected and H_1 is accepted, indicating that the independent variable, namely payment penetration ratio, collectively has a significant influence on the dependent variable, which is banking stability proxied by ROE.

IV. CONCLUSION

Based on the analysis results, three conclusions can be drawn: **1.** The significant amount of digital payments has a significant impact on Banking Stability proxied by ZScore; therefore, conventional banks in Indonesia should innovate to increase digital transactions using digital tools available in banking to enhance bank stability. **2.** The significant amount of digital payments has a significant impact on the ROA proxy. **3.** The significant amount of digital payments has a significant impact on the ROE proxy. Banking stability is only proxied by Z-Score, Return On Asset, and Return On Equity, while banking stability can be proxied by other more detailed and in-depth variables within banking ratios for both conventional and Islamic banks. This limitation occurs due to the researchers' constraints in accessing related information in-depth.

The researcher provides suggestions for further research on similar topics: 1. Subsequent research is expected to measure banking stability more deeply and comprehensively, including various forms of banking stability improvements that have not been measured in this study. 2. Proxy measurement of digital payments with market-based reference metrics, as this study only uses transaction-based metrics recorded by conventional banks. 3. Adding other proxies as additional control variables that may affect banking stability.

V. ACKNOWLEDGMENTS

The research could be completed due to the support from several parties, including: parents who have fully supported this research; spouse and children who have fully supported this research; the university, including the supervisors, program coordinators, and all staff who provided guidance and corrections; and closest friends who encouraged this research.

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