

The Impact of Income Diversification and Liquidity Risk on Stability of Conventional Banks In Indonesia

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ABSTRACT

This study aims to analyze the effect of income diversification and liquidity risk on the stability of conventional banks in Indonesia, focusing on banks listed on the Indonesia Stock Exchange during the periode 2014–2023 and using panel data regression methods. The results indicate that income diversification has a significant negative effect on bank stability. However, the moderating factors of KBMI 3 and KBMI 4 are able to strengthen the relationship between income diversification and bank stability. Liquidity risk does not affect bank stability, while KBMI 1 and KBMI 4 are found to weaken the impact of liquidity risk on stability. In contrast, KBMI 2 strengthens the effect of liquidity risk on bank stability. Banks need to carefully consider banking activities in diversifying income and take into account tier 1 capital in mitigating liquidity risk. KBMI serves as a moderator for both income diversification and liquidity risk. To the best of the author's knowledge, KBMI as a moderating variable in the relationship between income diversification and liquidity risk has not been previously examined. The implication of this study highlights the importance of regulatory oversight regarding risk exposure arising from income diversification and the optimization of liquidity within each KBMI category.

KEYWORDS Income Diversification; Liquidity Risk; Bank Stability



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INTRODUCTION

The banking industry plays a crucial role in maintaining the stability of a country's financial system and serves as a key driver of economic growth (Boachie et al., 2023). It holds significant influence over the national economy, and instability within the banking sector can potentially spill over into other areas of the economy (Crockett, 1997). Banking resilience serves as a supporting factor in maintaining the stability of the financial system, placing it in the Normal zone with a value of -0.49 as of December 2023 (Bank Indonesia, 2024). Bank Indonesia stated that the decline in credit risk, as reflected by a gross NPL ratio of 2.19% and a net NPL ratio of 0.71%, along with strengthened capital adequacy, can contribute to enhancing financial stability.

The scope of banking activities has expanded beyond conventional deposit and loan services to include various non-traditional operations such as insurance, securities trading, real estate investment, brokerage services, mutual fund management, and other avenues that generate non-interest income (Abuzayed et al., 2018; Adesina, 2021; Ben Lahouel et al., 2022; Kim et al., 2020; Wu, Chen, et al., 2020).

Ensuring the stability of banking institutions is essential, as it supports not only the integrity of financial markets but also the broader goals of economic growth and public welfare. A stable banking sector plays a key role in enabling credit distribution, supporting investment activities, and promoting effective capital allocation. Conversely, instability in the banking system can trigger significant negative impacts across various sectors, including businesses, households, and government operations. Therefore, identifying and understanding the factors that influence bank stability is critical in promoting long-term and sustainable economic development (Shabir et al., 2024).

Several studies examining the relationship between income diversification and bank stability have produced mixed results. Some findings suggest that income diversification can enhance bank stability by engaging in a broader range of financial activities (Wang & Lin, 2021; Nguyen et al., 2012; Rossi et al., 2009). According to Baele et al. (2007), diversifying income sources improves income quality by strengthening the intermediary role of banks and reducing information asymmetry. Moreover, it may stimulate financial innovation and intensify market competition (Lepetit et al., 2008; Acharya et al., 2006).

However, other researchers report contrasting evidence, indicating that income diversification may adversely affect bank performance and stability (Adesina, 2021; Ben Lahouel et al., 2022; Berger et al., 2010; Wu, Chen, et al., 2020). Increased diversification has been linked to greater competition (Winton, 1999) and higher profit volatility (DeYoung & Roland, 2001; Acharya et al., 2006). In contrast, recent findings by Shabir et al. (2024) reveal that both income and asset diversification contribute positively to banking stability in the MENA region. However, they also highlight that external factors such as political instability and climate risk may undermine financial stability in the banking sector.

To maintain banking stability, liquidity plays a critical role, as banks must be able to meet their obligations to depositors. Therefore, prudent and tight liquidity management is essential. Failure to effectively manage liquidity can lead to liquidity risk, which refers to a bank's inability to fulfil withdrawal demands from its customers. The consequences of liquidity risk can be severe, potentially accelerating bank failures, as evidenced by the collapse of Lehman Brothers in the United States and Northern Rock in the United Kingdom. These

failures were largely attributed to inadequate liquidity management and the concentration of funds in illiquid assets, resulting in liquidity mismatches. According to Bryant (1980) and Diamond and Dybvig (1983), the structure of a bank's assets and liabilities is inherently interconnected, where non-performing loans reflect asset quality and deposit withdrawals indicate a bank's ability to meet its liquidity obligations. The failure of liquidity management, which contributed to financial system instability, was a key factor in triggering the global financial crisis. This, in turn, led to a significant contraction in bank lending in the United States, with credit growth declining by up to 47% in the fourth quarter of 2008 (Ivashina and Scharfstein, 2010).

According to Bank Indonesia (2024), the liquidity condition of Indonesia's banking sector remains robust, as indicated by the Liquid Assets to Third-Party Funds (AL/DPK) ratio, which stands at 28.73%. Furthermore, based on data from the Financial Services Authority (OJK), key liquidity risk indicators—namely the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR)—remain well above the regulatory threshold of 100%. In addition, the liquidity risk level of commercial banks in Indonesia, as measured by the Loan to Deposit Ratio (LDR), has shown fluctuations over the 2016–2023 period. From 2016 to 2019, the LDR exceeded 90%, while during the pandemic period it declined to below 79%. By 2023, the LDR had increased again, reaching 83.83%.

In addition to maintaining banking stability and strengthening the risk management system, the Financial Services Authority (OJK) has reclassified the banking structure from the previous Commercial Bank Business Activities (BUKU) classification to the Core Capital-Based Bank Group (Kelompok Bank Berdasarkan Modal Inti/KBMI) through OJK Regulation No. 12/POJK.03/2021. This reclassification categorizes banks into four groups based on their core capital: KBMI 1 (core capital up to IDR 6 trillion), KBMI 2 (core capital between IDR 6–14 trillion), KBMI 3 (core capital between IDR 14–70 trillion), and KBMI 4 (core capital exceeding IDR 70 trillion). Under this categorization, OJK has also implemented regulations to ensure compliance with liquidity requirements.

This study critically examines the relationship between income diversification, liquidity risk, and bank stability, building on previous research such as Wang & Lin (2021), which found that income diversification can strengthen a bank's intermediary role and reduce information asymmetry, but neglected external factors like regulatory changes. Shabir et al. (2024) also explored diversification's positive effects on stability in the MENA region but did not account for liquidity management, a crucial aspect of banking stability. This research addresses these gaps by investigating how the recent Core Capital Bank Group classification in Indonesia, as mandated by the Financial Services Authority (OJK), moderates the relationship between diversification and stability,

incorporating liquidity risk as a critical factor.

This study aims to investigate the moderating role of the Core Capital Bank Group classification, as mandated by recent regulations issued by Indonesia's Financial Services Authority (OJK) through 12/POJK.03/2021, in the relationship between income diversification, liquidity risk, and bank stability. The study offers practical benefits for policymakers and banking institutions in improving risk management and regulatory frameworks.

RESEARCH METHOD

This study focuses on conventional banks operating in Indonesia during the period from 2014 to 2023. The sampling method employed is purposive sampling, with the main criterion being conventional banks listed on the Indonesia Stock Exchange (IDX). A total of 39 conventional banks listed on the IDX met the data availability requirements for the observation period. However, three data anomalies were excluded from the analysis, resulting in a total of 387 observations. The analysis in this study is conducted using panel data analysis method.

In this study, the dependent variable is bank stability, measured using the Z-Score. The independent variables include income diversification and liquidity risk, which is proxied by liquidity creation. Additionally, the model incorporates several control variables: Return on Assets (ROA), Capital Adequacy Ratio (CAR), credit growth, Loan to Deposit Ratio (LDR), bank size, and a dummy variable for the COVID-19 pandemic (where 0 indicates a non-pandemic period and 1 indicates a pandemic period). The model also includes gross domestic product (GDP) growth as a macroeconomic control variable.

Model 1 (The Effect of Income Diversification)

$$Z - Score_{i,t} = \beta_0 + \beta_1(DIV)_{i,t} + \beta_2(ROA)_{i,t} + \beta_3(CAR)_{i,t} + \beta_4(LG)_{i,t} + \beta_5(LDR)_{i,t} \\ + \beta_6(SIZE)_{i,t} + \beta_7(Crisis)_{i,t} + \beta_8(PDB)_{i,t} + \varepsilon_{i,t}$$

Model 2 (The Effect of Liquidity Risk)

$$Z - Score_{i,t} = \beta_0 + \beta_1(CNF)_{i,t} + \beta_2(ROA)_{i,t} + \beta_3(CAR)_{i,t} + \beta_4(LG)_{i,t} \\ + \beta_5(LDR)_{i,t} + \beta_6(SIZE)_{i,t} + \beta_7(Crisis)_{i,t} + \beta_8(PDB)_{i,t} + \varepsilon_{i,t}$$

Model 3 (The Effect of Income Diversification Moderated by KBMI)

$$Z - Score_{i,t} = \beta_0 + \beta_1(DIV)_{i,t} + \beta_2(KBMI)_{i,t} + \beta_3(DIV * KBMI)_{i,t} \\ + \beta_4(ROA)_{i,t} + \beta_5(CAR)_{i,t} + \beta_6(LG)_{i,t} + \beta_7(LDR)_{i,t} + \beta_8(SIZE)_{i,t} \\ + \beta_9(Crisis)_{i,t} + \beta_{10}(PDB)_{i,t} + \varepsilon_{i,t}$$

Model 4 (The Effect of Liquidity Risk Moderated by KBMI)

$$Z - Score_{i,t} = \beta_0 + \beta_1(CNF)_{i,t} + \beta_2(KBMI)_{i,t} + \beta_3(CNF * KBMI)_{i,t} \\ + \beta_4(ROA)_{i,t} + \beta_5(CAR)_{i,t} + \beta_6(LG)_{i,t} + \beta_7(LDR)_{i,t} + \beta_8(SIZE)_{i,t} \\ + \beta_9(Crisis)_{i,t} + \beta_{10}(PDB)_{i,t} + \varepsilon_{i,t}$$

Table 1. Research Variable

No	Variabel	Proxy	Previous Study
Dependent Variable			
1	Bank Stability (Z-Score)	$Z - Score = \frac{(ROA + (\frac{Equity}{Asset}))}{\sigma(ROA)}$	Shabir et al (2024)
Independent Variable			
1	Income Diversification (DIV)	$DIV_{it} = 1 - \left[\left(\frac{NII}{NOI} \right)^2 + \left(\frac{NON}{NOI} \right)^2 \right]$ NII : Net Interest Income NOI	Abuzayed et al. (2018) Shabir et al (2024)
2	Liquidity Risk (CNF)	$CNF = \frac{0,5 \times (\text{illiquid Assets}) + 0 \times (\text{semi - liquid Assets}) - 0,5 \times (\text{Liquid Assets}) + 0,5 \times (\text{Liquid Liabilities}) + 0 \times (\text{semi - liquid liabilities}) - 0,5 \times (\text{illiquid liabilities})}{\text{Asset}} \times 100\%$	Abdesslem et al (2022)
Control Variable			
1	Return on Aset (ROA)	$ROA = \frac{\text{Net Income}}{\text{Asset}}$	Vuong et al. (2023)
2	Capital Adequacy Rasio (CAR)	$CAR = \frac{\text{Tier 1} + \text{Tier 2}}{\text{Risk Weighted Asset}}$	Abdesslem et al (2022)
3	Loan Growth (LG)	$LG = \frac{\text{Loan}_t - \text{Loan}_{t-1}}{\text{Loan}_{t-1}} \times 100\%$	Vuong et al. (2023)
4	Loan to Deposit Rasio (LDR)	$LDR = \frac{\text{Loan}}{\text{Deposit}} \times 100\%$	Maroun & Fromentin (2024)
5	Size	Size = ln (Asset Total)	Vuong et al. (2023)
6	Crisis	A dummy variable where 0 represents the non-pandemic period and 1 represents the pandemic period	Hwang et al (2021)
7	GDP	GDPgrowth _{i,t} = Percentage of annual per capita GDP growth rate.	Vuong et al. (2023)
Moderation Variable			
	KBMI	Using variable dummy for KBMI in each KBMI	Aulia (2024)

RESULT AND DISCUSSION

Descriptive Statistic Analysis

Descriptive statistical analysis aims to present information regarding the characteristics of each variable in the study, including the mean, standard deviation, minimum, and maximum values. The variables analyzed descriptively include:

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Bank Stability (Z-Score), Income Diversification (DIV), Cat-Non-Fat (a proxy for liquidity risk/CNF), Return on Assets (ROA), Capital Adequacy Ratio (CAR), Loan Growth (LG), Loan to Deposit Ratio (LDR), Bank Size (Size), and Crisis (a dummy variable coded as 1 for the COVID-19 pandemic period and 0 for non-crisis periods), as well as Gross Domestic Product (GDP) growth.

Table 2. Descriptive Statistic Analysis

Variable	N	Mean	Std. Dev	Min	Max
Z Score	387	32,2	26,909	-0,036	155,656
DIV	387	0,286	0,129	0,030	0,499
CNF	387	0,137	0,142	-0,440	0,452
ROA	387	0,005	0,024	-0,159	0,047
CAR	387	0,274	0,206	0,080	1,699
LG	387	0,153	0,449	-0,405	4,913
LDR	387	0,876	0,330	0,297	4,667
Size	387	17,456	1,865	12,350	21,499
Crisis	387	0,297	0,458	0	1
GDP	387	0,042	0,021	-0,021	0,053

Based on Table 2, the average Z-Score value is 32.200 with a standard deviation of 26.909, ranging from a minimum of -0.036 to a maximum of 155.656. This indicates substantial variability in bank stability across institutions. The minimum Z-Score of -0.036 reflects a highly vulnerable bank PT Bank Raya Indonesia Tbk in 2021 while the highest stability is represented by PT Bank Bumi Arta Tbk in 2023. Regarding the Income Diversification variable, the average value among the sampled banks is 0.286 with a standard deviation of 0.129. The range spans from a minimum of 0.03 to a maximum of 0.499, suggesting a generally moderate level of income diversification. Specifically, PT Bank of India Indonesia recorded the lowest level of diversification in 2023, while the highest was observed in PT Bank Mayapada Internasional Tbk in 2020. Liquidity risk, proxied by Liquidity Creation (Cat-Non-Fat/CNF) as proposed by Berger (2009), shows an average value of 0.137, with a minimum of -0.44 and a maximum of 0.45. These findings indicate that, in general, banks tend to rely more on liquid liabilities to finance long-term assets. PT Bank Jago Tbk had the lowest CNF value in 2019, while the highest was recorded by PT Bank Mestika Darma in 2018. The low minimum value reflects suboptimal liquidity creation and a potential reduction in short-term liquidity risk.

For the control variable Return on Assets (ROA), the average is 0.005, with a range from -0.158 to 0.047. PT Bank Jago Tbk recorded the lowest ROA in 2019, while PT Bank Amar Indonesia Tbk achieved the highest in 2023. The Capital Adequacy Ratio (CAR) has an average of 0.276, with values ranging from a minimum of 0.080 to a maximum of 1.699, indicating compliance with the OJK's

minimum capital requirements of 8% (OJK, 2016). The lowest CAR was reported by PT Bank Pembangunan Daerah Banten Tbk in 2015, while the highest was recorded by PT Bank Jago Tbk in 2021. Loan Growth (LG) shows an average of 0.153, with a minimum of -0.405 and a maximum of 4.913. Negative credit growth occurred not only during the COVID-19 pandemic but also prior to it in certain banks. PT Bank Raya Indonesia Tbk recorded the lowest credit growth in 2021, whereas PT Bank Jago Tbk had the highest. The Loan to Deposit Ratio (LDR) averages at 0.876, ranging from 0.296 to 4.667. Most banks meet Bank Indonesia's target LDR range of 78%–92%; however, some fall outside this range, triggering disincentive mechanisms related to the minimum reserve requirement (Bank Indonesia, 2013). PT Bank Ina Perdana Tbk had the lowest LDR in 2021, and the highest was observed in PT Bank Amar Indonesia Tbk in 2016. The Size variable, measured by the natural logarithm of total assets, shows an average of 17.456, ranging from 12.350 to 21.499. PT Bank Amar Indonesia Tbk was the smallest bank in 2014, while PT Bank Mandiri (Persero) Tbk was the largest in 2023. The Crisis variable serves as a proxy for external shocks and distinguishes between the COVID-19 pandemic period (coded as 1) and normal conditions (coded as 0). The non-pandemic period covers the years 2014–2019 and 2023, while the pandemic period spans 2020 to mid-2023 (PP, 2023). Since this study uses end-of-year (December) data, the year 2023 is classified as a normal period. Gross Domestic Product (GDP) growth, which reflects the macroeconomic conditions, recorded an average rate of 0.042 over the ten-year period. The lowest GDP growth was observed in 2020 at -0.02, while the highest occurred in 2022, reaching 0.053.

This study conducted classical assumption tests, including tests for normality, multicollinearity, and heteroscedasticity. Any issues identified in these diagnostic tests were addressed by applying robust estimation techniques.

The Effect of Income Diversification on Bank Stability

Tabel 3. The Effect of Income Diversification on Bank Stability

Variabel	Zscore				
	All Bank	KBMI 1	KBMI 2	KBMI 3	KBMI 4
DIV	-11,791* (6,598)	-10,838* (6,371)	-11,088* (6,397)	-11,757* (6,698)	-14,769** (6,919)
KBMI	-	-3,870 (5,473)	2,423 (0,413)	-0,782 (1,199)	11,495 (13,086)
ROA	58,533** (24,927)	56,828** (24,367)	59,285** (24,080)	59,120** (25,149)	63,591*** (23,892)
CAR	36,381*** (12,124)	35,699*** (12,054)	36,028*** (12,061)	36,405*** (12,148)	35,534*** (12,192)
LG	-3,176* (1,594)	-3,212** (1,580)	-3,219* (1,594)	-3,183* (1,60)	-3,420** (1,663)
LDR	-1,768 (3,165)	-1,902 (3,074)	-1,847 (0,555)	-1,766 (3,167)	-2,057 (3,144)

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Variabel	Zscore				
	All Bank	KBMI 1	KBMI 2	KBMI 3	KBMI 4
Size	-1,452 (2,066)	-2,039 (2,047)	-1,800 (1,991)	-1,446 (2,072)	-0,503 (1,812)
Crisis	-0,487 (1,887)	-0,411 (1,830)	-0,349 (1,818)	-0,458 (1,912)	-0,787 (1,852)
PDB	23,382 (19,234)	23,452 (19,072)	24,066 (18,882)	23,588 (19,393)	19,340 (19,109)
Kontanta	51,790	64,172	57,432	23,588	35,682
Observasi	387	387	387	387	387
Total Bank	39	39	39	39	39
R ²	0,278	0,281	0,280	0,278	0,276

***significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

Table 3 indicates that income diversification has a statistically significant effect on bank stability at the 10% level across all banks when KBMI classifications are not considered. However, when examining the results by KBMI groups, income diversification remains significant at the 10% level for KBMI 1 through KBMI 3, and at the 5% level for KBMI 4. Notably, the relationship between income diversification and bank stability is negative. Regarding the control variables, Return on Assets (ROA) shows a significant positive association with bank stability, with a 5% significance level for all banks as well as KBMI groups 1 through 3, and a stronger 1% significance level for KBMI 4. Capital Adequacy Ratio (CAR) also exhibits a positive and highly significant relationship with bank stability at the 1% level across all groups. Credit growth shows a significant negative effect at the 10% level for the overall sample and for KBMI 2 and 3, while for KBMI 1 and 4, the effect is significant at the 5% level. Other control variables, including LDR, bank size (Size), the COVID-19 pandemic dummy, and GDP growth, do not show any significant impact on bank stability at the 1%, 5%, or 10% significance levels.

During the study period, conventional banks in Indonesia showed a statistically significant but negative relationship between income diversification and bank stability, both overall and across KBMI groups. This contrasts with the findings of Shabir (2024), who reported that diversification enhances banking stability. However, the negative association aligns with Abuzayed et al. (2018), who suggested that exposure to non-traditional activities may increase income volatility and risk, such as from investments or fee-based services. According to OJK's 2023 Indonesian Banking Statistics, non-interest income in commercial banks is largely derived from spot and derivative transactions, comprising 45.36% to 64.07% of such income between 2021 and 2023. In contrast, income from dividends, commissions, and fees declined from 18.96% in 2021 to 15.54% in 2023. This dominance of market-sensitive sources suggests that foreign exchange market fluctuations may negatively affect bank stability. Shifting non-interest income

toward more stable sources like commissions and service fees directly related to banking products may help improve stability in Indonesia's banking sector.

The Effect of Liquidity Risk on Bank Stability

Table 4. The Effect of Liquidity Risk on Bank Stability

Variabel	Zscore				
	All Bank	KBMI 1	KBMI 2	KBMI 3	KBMI 4
CNF	7,364 (12,196)	8,702 (12,089)	8,441 (12,257)	7,443 (12,289)	8,611 (12,403)
KBMI	-	-4,860 (5,398)	3,080 (2,951)	-1,059 (1,430)	10,422 (13,159)
ROA	62,715** (27,542)	59,545** (26,050)	62,879** (26,214)	63,462** (27,741)	68,685** (27,322)
CAR	39,878** (14,865)	39,543** (14,850)	39,852** (14,870)	39,943** (14,925)	39,667*** (15,085)
LG	-3,065* (1,573)	-3,145* (1,566)	-3,146* (1,584)	-3,076* (1,585)	-3,267 (1,628)
LDR	-2,104 (3,446)	-2,366 (3,306)	-2,279 (3,352)	-2,107 (3,449)	-2,399 (3,452)
Size	-1,848 (0,374)	-2,561 (2,033)	-2,272 (1,990)	-1,839 (2,061)	-1,006 (1,830)
Crisis	-0,581 (0,767)	-0,448 (1,880)	0,377 (1,882)	-0,540 (1,985)	-0,905 (1,923)
PDB	32,911 (21,066)	32,408 (20,938)	33,354 (20,835)	33,173 (21,264)	31,191 (21,050)
Constanta	53,242	68,487	60,175	53,255	37,809
Observation	387	387	387	387	387
Bank Total	39	39	39	39	39
R ²	0,272	0,277	0,276	0,272	0,270

***significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

Table 4. shows that the liquidity risk variable (CNF) does not have a statistically significant effect on bank stability at the 1%, 5%, or 10% levels across all banks, including KBMI groups 1 to 4. Among the control variables, ROA is significant at the 5% level for all banks and across all KBMI groups, indicating a positive relationship with bank stability. CAR is also significant at the 5% level for all banks and KBMI groups 1 to 3, and remains significant for KBMI 4. Credit growth shows a negative and significant relationship with bank stability at the 10% level for all banks and KBMI groups 1 to 3, but is not significant for KBMI 4. Other variables, including LDR, bank size, the COVID-19 pandemic dummy, and GDP growth, do not show any significant effect on bank stability.

Liquidity risk occurs when a bank cannot meet short-term obligations without incurring significant losses. While liquidity creation reflects effective intermediation, poor management can pose risks. This study finds no significant impact of liquidity risk on bank stability across all banks and KBMI groups, contrasting with Abdeslam et al. (2022), who found a positive link between

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liquidity creation and bank failure. This may be due to Indonesian banks maintaining the required minimum capital adequacy ratio (8%) and implementing LCR and NSFR standards, especially in KBMI 2 to 4, to manage liquidity risk effectively.

The Moderating Effect of KBMI and Income Diversification on Bank Stability

Table 5. The Moderating Effect of KBMI and Income Diversification on Bank Stability

Variable	Zscore			
	KBMI 1	KBMI 2	KBMI 3	KBMI 4
DIV	-4,468 (8,674)	-9,243 (6,960)	-14,705* (7,456)	-15,627** (7,067)
KBMI	-1,644 (6,610)	5,615 (6,563)	-11,518** (5,396)	-5,666 (8,961)
DIV*KBMI	-9,066 (12,248)	-10,559 (15,062)	26,506** (12,581)	45,633** (19,396)
ROA	56,126** (23,791)	58,678** (24,319)	58,363** (24,449)	63,179*** (23,843)
CAR	35,765*** (12,099)	35,878*** (12,087)	36,508*** (12,217)	35,641*** (12,224)
LG	-3,235** (1,592)	-3,204* (1,598)	-3,234* (1,616)	-3,393** (1,655)
LDR	-1,975 (3,094)	-1,923 (3,066)	-2,053 (3,130)	-2,141 (3,150)
Size	-1,909 (2,004)	-2,076 (1,929)	-1,450 (2,089)	-0,609 (1,843)
Crisis	-0,420 (1,836)	-0,288 (1,783)	-0,203 (1,918)	-0,884 (1,869)
PDB	24,620 (19,808)	24,033 (18,888)	27,600 (20,087)	19,421 (19,158)
Constanta	60,190	61,766	53,300	37,783
Observation	387	387	387	387
Bank Total	39	39	39	39
R ²	0,282	0,282	0,282	0,279

***significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

Table 5 indicates that income diversification is statistically significant at the 10% level for KBMI 3 and at the 5% level for KBMI 4. As a moderating factor, KBMI demonstrates a positive influence on bank stability, particularly within KBMI 3 and KBMI 4, both showing significance at the 5% level. Return on Assets (ROA) is significant at the 5% level for KBMI groups 1 through 3, and at the 1%

level for KBMI 4, suggesting a stronger impact among larger banks. Capital Adequacy Ratio (CAR) maintains consistent significance at the 1% level across all groups, indicating its robust contribution to bank stability. Loan growth presents varying levels of significance but consistently shows a negative relationship with bank stability.

This study finds that the moderating effect of KBMI is significant for KBMI 3 and 4, indicating that banks with higher core capital are more likely to diversify income and enhance stability. Data from the 2023 Indonesian Banking Statistics show that non-interest income from spot and derivative gains comprises 30–51%, while commissions, dividends, and fees contribute 21–31%, helping offset exchange rate volatility. As noted by Cahyaningtias and Sasanti (2019), fee-based income from securities and interbank placements is a promising revenue source that can reduce potential losses. These findings support Danisman and Tarazi (2024), who state that well-capitalized banks are more resilient to economic uncertainty.

The Moderating Effect of KBMI and Liquidity Risk on Bank Stability

Table 6. The Moderating Effect of KBMI and Liquidity Risk on Bank Stability

Variable	Zscore			
	KBMI 1	KBMI 2	KBMI 3	KBMI 4
CNF	29,430* (16,332)	2,627 (11,872)	7,980 (12,752)	9,097 (12,484)
KBMI	-2,163 (4,703)	-0,030 (2,344)	-0,105 (2,411)	24,588* (14,612)
CNF*KBMI	-27,814** (13,659)	30,839** (13,808)	-9,385 (21,269)	-49,341*** (15,560)
ROA	61,748** (30,260)	65,233** (31,160)	63,447** (27,700)	68,323** (27,286)
CAR	38,268** (14,685)	39,311** (14,749)	40,166** (15,092)	39,875*** (15,125)
LG	-2,504* (1,419)	-2,433* (1,390)	-3,075* (1,587)	-3,267** (1,628)
LDR	-2,195 (3,345)	-2,137 (3,418)	-2,121 (3,462)	-2,406 (3,460)
Size	-2,334 (2,011)	-2,032 (1,977)	-1,845 (2,068)	-1,035 (1,837)
Crisis	-0,344 (1,914)	-0,270 (1,922)	-0,537 (1,988)	-0,926 (1,923)
PDB	34,347 (21,209)	36,849* (21,530)	33,527 (21,589)	31,492 (21,074)
Constant	34,347	56,849	53,331	38,179
Observation	387	387	387	387
Bank Total	39	39	39	39
R ²	0,288	0,290	0,273	0,272

***significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

ROA is found to be statistically significant at the 5% level across all banks, including KBMI groups 1 through 4, and demonstrates a positive relationship with bank stability. Similarly, CAR is significant at the 5% level for KBMI groups 1 to 3 and at the 1% level for KBMI 4, also showing a consistently positive association with stability. In contrast, credit growth exhibits a negative and statistically significant relationship with bank stability at the 10% level for KBMI groups 1 to 3 and at the 5% level for KBMI 4. Meanwhile, the control variables LDR, bank size, the COVID-19 pandemic dummy, and GDP growth do not show a significant impact on bank stability.

The moderation effect of KBMI on liquidity risk reveals varied outcomes across bank groups. In KBMI 1, lower core capital tends to weaken liquidity risk, likely due to more cautious funding allocation, consistent with Smoui et al. (2020), who suggest that banks with high deposit levels may take on more risk. In contrast, KBMI 2 shows a tendency to increase liquidity risk to enhance stability, as reflected in aggressive credit and securities growth in 2022 and 2023. These findings contrast with Abdeslam (2022), who found that higher liquidity creation raises the likelihood of bank failure. For KBMI 4, liquidity risk is mitigated through stronger capital buffers, improving stability supporting Moroun and Fromentin (2024), who found a negative link between liquidity creation and risk in large banks. This also aligns with Alkhazali et al. (2024), who emphasize that strong, high-quality capital serves as a shock absorber, ensuring both bank resilience and sustained credit flow.

CONCLUSION

This study investigated the effect of income diversification and liquidity risk on the stability of conventional banks in Indonesia, while also analyzing the moderating role of core capital-based bank groups (KBMI). Using panel data from 2014 to 2023 and incorporating control variables such as ROA, CAR, loan growth, LDR, bank size, the COVID-19 crisis dummy, and GDP growth, the findings reveal that income diversification significantly and negatively influences bank stability. This outcome is consistent across all KBMI groups and suggests that high exposure to volatile non-interest income sources, particularly from spot and derivative transactions, may undermine financial stability. In contrast, liquidity risk—measured using the liquidity creation proxy—does not exhibit a statistically significant impact on bank stability across the overall banking system. The result may reflect the effect of regulatory compliance, particularly the fulfillment of capital adequacy requirements, which serve as buffers against potential liquidity shocks. Furthermore, the moderation analysis reveals that KBMI strengthens the relationship between income diversification and bank stability in KBMI 3 and KBMI 4, indicating that larger banks with stronger capital bases and more advanced risk management systems are better equipped to benefit from diversification

strategies. The moderation effect of KBMI on liquidity risk shows a varied impact. While KBMI 1 and KBMI 4 are associated with a mitigating effect on liquidity risk, KBMI 2 appears to leverage liquidity risk to support stability through increased lending and investment activity. These findings emphasize the importance of capital strength and institutional capacity in determining how banks manage and respond to liquidity risk and income diversification. Future studies are encouraged to explore alternative measurements of liquidity and income diversification, and to include other banking models such as Islamic banks, to enrich the understanding of bank stability in varying regulatory and institutional contexts.

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