Determination of Bank Health Through Profitability as an Intervening Variable in Conventional Banks

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Abstract. The aim of this study is to test the determination of bank health through profitability as an intervening variable in conventional banks. The study employed a quantitative approach, utilizing a structural equation model (SEM) analysis. The data is 105 conventional banks in Indonesia from 2018 to 2023. The results indicate that there is a direct effect of macroeconomic variables, liquidity risk and credit risk on profitability. However, the indirect effects of these variables on bank health do not exist. In contrast, the indirect effects of macroeconomic variables and liquidity on credit risk and profitability are significant. The findings of this research indicate that macroeconomic indicators, liquidity risk, credit risk, and profitability are the primary factors influencing the health of banks. This study concludes that only credit risk and profitability have an effect on bank health while liquidity and macroeconomic risks, and credit risk have an effect on increasing profitability. Therefore, banks must meet capital adequacy (CAR) to overcome the increasingly high credit risk, banks provide a certain amount of funds to bear the burden of losses in the event of a default.

Keywords: Credit Risk, Liquidity Risk, Profitability, Macro Variables and Bank Health.

1 INTRODUCTION

Analyzing credit risk, liquidity risk, and profitability is essential for the health of banks because each aspect is interrelated and affects the financial stability of banks. Credit risk relates to the debtor's ability to repay loans, where high levels of bad loans can eat into banks' revenues and increase loss reserves. Liquidity risk concerns the bank's ability to meet its short-term obligations without having to sell assets at large losses, which can trigger a crisis of confidence among customers and investors. High profitability indicates the bank's efficiency in managing assets and generating profits, which is essential for attracting investment and supporting growth. By analyzing and managing these three risks holistically, banks can ensure operational stability, minimize potential losses, and maximize profits, thereby maintaining overall financial health.

On the other hand, the concept of bank welfare is used by the public as a benchmark for the bank's ability to develop and compete effectively in its market. In its operations to raise funds and channel funds, the bank will provide and charge funds in the form of interest at a

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specified rate for a specified period. In this context, the bank is considered a conventional bank. The percentage of certain rewards charged and determined by the bank is carried out with a risk approach that the bank accepts. However, the Financial Services Authority (OJK) also sets a base interest rate for banks, in addition to the approach through bank health or performance level.

Banks globally are encountering difficulties as a consequence of inadequate liquidity management. Each transaction or commitment a bank undertakes is inherently linked to its liquidity. Consequently, the effective management of liquidity risk is of paramount importance. It is imperative that banks maintain sufficient liquidity to withstand all potential scenarios. It is paramount to conduct a continuous assessment of the liquidity risk management framework and liquidity position to ensure the bank's proper functioning. Consequently, banks must maintain an optimal level of liquidity in order to generate greater profits and fulfill their obligations. The minimum liquidity coverage ratios that banks must adhere to are outlined in Baker (2020).

Shareholders are interested in the profitability of the bank, or the value of profits earned against capital held. Shareholders are interested in the profitability of the bank, as this determines the return on their investment. Profitability is defined as the total income and expenses incurred by the bank over a specified period, expressed as a ratio of assets and liabilities. The primary objective of a bank is to generate profits. A higher level of profitability is associated with a reduced probability of financial difficulties for the bank in question.

In developing countries, inflation rates are subject to considerable fluctuations. A country with an inflation rate of 3% is considered to be within the normal range. The government plays a pivotal role in stabilizing the economy by suppressing inflation through an increase in interest rates on bank funds. It is anticipated that with the increase in interest rates, individuals will deposit their funds in banks. Consequently, banks are able to amass greater financial resources.

As illustrated in Figure 1, the inflation rate was relatively low at the end of December 2019, prior to the onset of the pandemic. However, following the pandemic's emergence at the end of December 2019, inflationary pressures have eased, largely due to a shift in consumer preferences towards holding cash rather than savings. In March 2022, as the global economy began to recover from the pandemic, the business sector's condition remained unstable.

Previous research has found that NPLs have a negative and significant effect on profitability (Ariwidanata, 2016b; Mosey et al., 2018b; Tarigan & Tandeas, 2022). Previous research has also found that macroeconomics is positive and significant to profitability (Dewi et al., 2019; Katırcıoglu et al., 2020; Yaaba, 2016; Yahya et al., 2014). However, it was found that it was positive and insignificant to profitability (Capriani & Dana, 2019; Singh et al., 2021). Meanwhile, Liquidity Risk was found to have a positive and significant effect on Profitability (Capriani & Dana, 2019b; Haryanto, 2016a; Nartaresa, 2021b; Saleh & Abu

Afifa, 2020b). However, other studies have found that liquidity risk has a negative and significant effect (Ariwidanata, 2016).

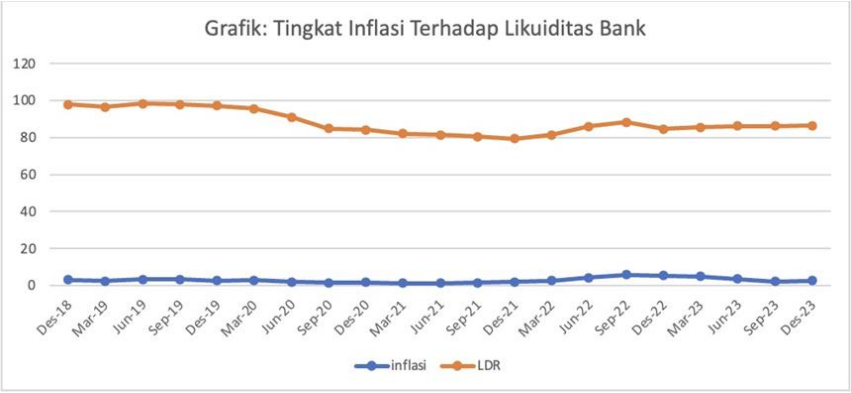

Fig 1. Inflation Rate on bank liquidity (Source: BPS, 2024)

An additional study carried out by Amrullah & Herizon (2018) discovered that profitability has a positive and large impact on bank health, whereas credit risk has a negative and significant impact on banks (Halim & Dharmastuti, 2022). Regarding liquidity risk variables, other studies found that they had a negative and significant effect on bank health (Abdul Hadi1 et al., 2018; Halim & Dharmastuti, 2022; Mohammed et al., 2022). However, several studies have found that liquidity has a positive and significant effect on bank health (Obayagbona & Osagiende, 2023). The disparities between the results of earlier research and the significant knowledge gap point to the necessity of more study in order to fully comprehend the subject.

2 LITERATURE REVIEW

2.1 Banking Theory

The legal framework governing banking in Indonesia is set out in Article 1 of Law No. 10 of 1998 on Banking. The establishments, commercial endeavors, and modes and procedures of their activities are defined in this article. A bank is an establishment that, in order to enhance people's quality of life, receives funds from the general public in the form of deposits and subsequently disburses those monies to the public in the form of credit and other financial instruments (Law No. 10 of 1998). Commercial banks and rural banks are the two main categories into which banks may be divided. Commercial banks are those that offer services in the area of payment traffic and conduct business in line with accepted practices and/or sharia law. A traditional or Sharia-compliant bank that does not offer payment traffic services is called a Bank Perkreditan Rakyat (BPR). “

The only depository financial institutions authorised to collect funds directly from the public are banks. This includes deposits, current accounts, and savings. Moreover, the funds collected can be reinvested in the bank's wealth through loans and investments. Banks differ from other financial institutions in terms of their operational structure. Moreover, when

banks collect funds from the public or third parties, they may engage in business activities that are similar to those of other financial institutions.

2.2 Credit Risk Theory of Banking Performance

Risk Theory

a. Credit Risk (NPL)

Credit risk represents the most significant factor influencing the performance of banks (Boffey & Robson, 1995). Credit risk is defined as the possibility that the borrowing company is unable or unwilling to pay the principal and interest in accordance with the financing contract (Zhu et al., 2016). It is one of the risks faced by banks in the allocation of resources. It is defined as the probability of unpaid or delayed payments by customers or their inability to repay loans (Cisko & Klieštik, 2013). In Moradi & Mokhatab Rafiei (2019), it is described as a term used to describe the possibility of loss from a borrower's failure to repay a loan or fulfill contractual obligations. It is a fundamental consideration in the banking and finance industry. It encompasses the possibility that loans issued by banks will not be fully or partially returned on time as well as the possibility that clients or counterparties may default. The risk that a borrower will default and thus fail to fulfil their obligation to repay the debt. This occurs when a counterparty defaults or fails to make a payment on time (Martens et al., 2009). This research assesses the credit risk of:

- Credit

Credit risk is defined as the risk of default by debtors or other parties to fulfil the bank's obligations. In general, two methods exist for measuring credit risk. The first approach is the standardized approach, which utilises risk weights derived from external assessments. The second approach is the Internal Rating Based (IRB) approach. The IRB approach permits banks to determine their own measurement parameters, including the probability of error, the given error rate, the debtor-adjusted rate of return, and the debtor-adjusted rate of return. Credit risk is the possibility that customers, debtors, or other parties will be unable to fulfill their financial obligations in accordance with contracts or agreements that have been made. It is possible to extend the concept of credit risk to encompass the phenomenon of credit deterioration. A decline in credit quality does not necessarily imply an increase in the likelihood of default. However, at the very least, the likelihood of default will increase.

$$CR = \frac{\text{Total Loan} - \text{Bad Debt Allowance}}{\text{Total Aset}} \quad (1)$$

- CAR (Capital Adequacy ratio)

The Capital Adequacy Ratio (CAR), sometimes known as the capital ratio, is a measure of a bank's ability to both reduce the risk of losses from banking operations and supply money for business development. As mentioned by (Sangmi & Nazir, 2010), a higher CAR indicates a stronger bank condition with superior performance. However, a CAR that is excessively high indicates a conservative approach and the potential underutilization of capital. According to Bank Indonesia Regulation Number 10/15/PBI/2008, Capital Adequacy, Article 2 Paragraph 1, banks are required to keep 8% of their risk-weighted assets

(RWA) in capital. A ratio called the CAR shows what percentage of a bank's total assets are funded by both its own capital and outside funding (PBI, 2008). The principle that every risk-bearing investment must provide a certain percentage of capital for its total investment is employed in the calculation of capital adequacy. In accordance with the standards set by the Bank for International Settlements (BIS), every bank in Indonesia is required to maintain a minimum capital of 8% of its risk-weighted assets (RWA) (PBI, 2011). The capital adequacy ratio (CAR) is calculated as follows:

$$CAR = \frac{\text{Eligible Capital}}{\text{Risk Weighted Assets}}\ x\ 100\% \qquad (2)$$

- Net NPL (Non-Performing Loan Net)

Conversely, Net NPL represents the ratio of non-performing loans, calculated by deducting CKPN (provision for impairment losses) from the total loans. A higher net NPL ratio indicates a deterioration in the quality of the bank's credit portfolio, leading to an increase in the number of non-performing loans. A net NPL ratio below 5% indicates a smaller allowance for impairment losses (PPAP) that the bank must provide to cover losses caused by non-current earning assets (non-performing loans).

$$\text{Net NPL Ratio} = (\text{Total Loans}\text{Total NPL}-\text{Loan Loss Reserves}) \times 100\% \qquad (3)$$

b. Liquidity Risk

In accordance with Bank Indonesia Regulation No. 11/25/PBI/2010, which amends Bank Indonesia Regulation No. 5/8/PBI/2003, dated 19 May 2003, regarding the implementation of risk management, commercial banks are obliged to manage or consider eight types of risk. Liquidity risk is one of the risks that must be managed or considered by commercial banks. In accordance with the PBI, liquidity risk is defined as the inability of a bank to meet its maturing obligations from cash flow funding and/or liquid assets without disrupting the bank's daily activities. According to this definition, banks must be able to provide reserve funds in situations where customer funds are withdrawn suddenly, and invested assets must be liquid enough to disburse to meet the needs (Muranaga & Ohsawa, 2002). In general, banks manage their assets and liabilities with a focus on liquidity risk. Optimal liquidity is defined as liquidity that is able to create optimal income and prevent liquidity risk (Wuryandari et al., 2020). Liquidity risk is a financial risk due to liquidity uncertainty. A bank may experience a reduction in its liquidity if its credit rating declines, it encounters unanticipated cash outflows or other circumstances that prompt other parties to avoid transactions or lending to the institution. Furthermore, companies may be exposed to liquidity risk if the markets in which they participate experience a decrease in liquidity. This study examines liquidity risk in the following manner:

- LDR (Loan to Deposit Ratio)

Shen et al. (2016) define liquidity risk as the ratio between liquid assets and liabilities or the ratio between total loans granted by banks and funds received. In accordance with the findings of Dendawijaya (2014), the ability of a bank to repay depositor withdrawals, which

represents a source of liquidity, can be gauged by means of the Loan to Deposit Ratio (LDR). Dendawijaya (2014) employs a methodology for measuring liquidity risk based on the LDR, which employs the following calculation formula:

$$\text{LDR} = \frac{\text{Total Loans}}{\text{Liabilities}}\ x\ 100\% \quad (4)$$

An elevated LDR is indicative of a diminished liquidity capacity within the banking institution. Conversely, a reduced LDR is indicative of an enhanced liquidity capacity. Consequently, a higher LDR indicates a more challenging liquidity position for the bank, while a lower LDR indicates a reduced capacity to extend credit. Endogenous liquidity (also referred to as endogenous liquidity) and exogenous liquidity (also referred to as exogenous liquidity) represent two distinct categories of liquidity risk (Anam, 2013). Exogenous liquidity, which is typically referred to as financing liquidity, is liquidity generated by the bank's liability structure, thereby enabling the bank to identify any potential mismatches. In contrast, endogenous liquidity is liquidity inherent in the bank's own assets and affects the bank's ability to sell assets in a liquid market with a small spread and unaffected by transaction volume.

- BOPO (Operating cost to Operating income ratio)

The operating expenses to operating income (BOPO) ratio, also referred to as the efficiency ratio, is employed to assess the efficacy of bank management in offsetting operating expenses with operating income. BOPO is a ratio that is employed to assess the efficiency of a bank and its capacity to conduct its operations. (Prasnanugraha P, 2007) defines operating expenses as the costs incurred by the bank to run its main business. Conversely, operating income represents the primary source of revenue for the bank, deriving from the placement of funds in the form of loans and other operating income.

Bank Indonesia Regulation No. 6/10/PBI/2004 dated 12 April 2004 and Bank Indonesia Circular Letter No. 6/23/DPNP dated 31 May 2004 mandate that all commercial banks conducting business in a conventional manner perform a soundness assessment every three months, specifically in March, June, September, and December. In accordance with Pernyataan Standar Akuntansi Keuangan (PSAK) “Financial Accounting Standards” No. 1 (2015:9), the aim of financial statements is to provide relevant and meaningful information to a wide variety of users who use them to make financial choices about the entity's cash flow, financial performance, and financial situation. In addition, the financial accounts show that management is responsible for how the resources are used.

$$\text{Operation Cost to Operating Income Ratio} = \left(\frac{\text{Operating Cost}}{\text{Operating Income}}\right) x\ 100\% \quad (5)$$

- Third Party Funds

As outlined by Nadia (2010), third-party funds represent a significant factor influencing the maintenance of bank liquidity. Customer deposits represent funds collected by banks in the course of performing their intermediary function. The function of the bank that ensures the availability of liquidity for its customers necessitates the calculation of a certain proportion

of the total DPK funds. Consequently, an increase in the bank's DPK will result in an increase in its liquidity.

Nandadipa & Prasetiono (2010) clarified the connection in traditional banks between DPK growth and LDR. Their research's conclusions show that whereas other deposits have a favorable impact on LDR, third-party funds have a negative impact. As a result, third-party funds have a detrimental effect on liquidity. The ratio of liquid assets to third-party funds indicates the bank's ability to satisfy its liquidity requirements in the event that third-party fund withdrawals occur. Demand deposits, time deposits, certificates of deposit, and other short-term obligations are examples of third-party money. Cash, current account balances with central banks and correspondent banks, and checks used for collection are examples of liquid assets. Moreover, the high ratio of liquid assets to deposits contributes to the bank's excellent liquidity.

Third-Party Funds = Deposits from Customers + Deposits from Other Banks + Other External Funding

Profitability

Profitability is the culmination of numerous policies and decisions Ehrhardt & Brigham (2016). Profitability ratios provide useful insights into the effectiveness of a company's operations, taking into account the combined effects of liquidity, asset management, and the company's operational debt. As defined by Setiawan & Mahardika (2019), profitability is the capacity of an organization or company to generate profits based on sales, total assets, and its own capital. Profitability is a company measurement that enables the generation of profits (or profits based on sales, total assets, and own capital) in order to ensure the continued operational activities of the company (going concern). Consequently, it can be posited that profitability represents a company measurement that is employed by company management as a means of ensuring the generation of profits and the long-term growth of the business. The company's profitability ratio represents the company's capacity to generate net income from activities conducted during the accounting period.

$$\text{ROA} = \left(\frac{\text{Net Income}}{\text{Total Assets}}\right) x\ 100\% \quad (6)$$

2.3 Bank Health

The capacity of a financial institution to operate in a prudent and compliant manner is referred to as its bank wellness rating. A bank is considered healthy if it is able to perform its intermediation function well, maintain public trust, help to smooth payment traffic, and implement monetary policy (Santoso & Triandaru, 2006). In essence, all parties involved in the assessment of bank soundness, including bank owners, managers (management), the public who utilise bank services, Bank Indonesia as the supervisory authority, and other parties, participate in the process. “The application of prudent principles, compliance with risk management, and the observance of pertinent regulations permit the utilisation of data on the level of bank health in the assessment of bank performance (Lubis, 2009). Bank Indonesia is an institution appointed by the government to set standards for the

implementation of bank rating assessments. Since January 2012, Bank Indonesia Regulation (PBI) No. 13/1/PBI/2011 on the Health Assessment of Commercial Banks, also known as the RGEC method, which includes risk profile, good corporate governance, profit, and capital, has become a mandatory guideline for all banks in Indonesia (Pramana & Artini, 2016).

$$\text{Tier 1 Capital Ratio} = \left(\frac{\text{Tier 1 Capital}}{\text{Risk–Weighted Assets}}\right) x\ 100\% \quad (7)$$

2.4 Macroeconomics

Macroeconomic factors are statistical data that provide a clear and comprehensive overview of a country's economic performance. These indicators facilitate the reconciliation of a country's financial and economic performance. The performance of each sector is influenced by these indicators, particularly in the banking sector. The aforementioned indicators determine the actions of various sectors within the country, influencing their respective work. This is consistent with the view of Kočenda & Valachy (2006), who posit that the stability or instability of macroeconomic variables is contingent upon the prevailing economic circumstances within a given country. Furthermore, increased cross-border currency flows resulting from foreign direct investment and services such as banking, insurance, education, and tourism contribute to the random fluctuations in exchange rates. The advent of online trading has led to a proliferation of currency speculation, which in turn has contributed to the observed fluctuations in exchange rates.

3 RESEARCH METHODOLOGY

The type of this research is exploratory or descriptive in nature. In exploratory research, researchers investigate potential relationships that may lead to further theory development, rather than focusing on well-developed theories or causal justifications (Hair et al., 2018). This research was conducted using both longitudinal and cross-sectional methods.

In order to ascertain the causal relationship, a Structural Equation Model (SEM) analysis was conducted, with the independent variable (credit risk, liquidity risk, and macroeconomics) and the dependent variable (bank health) being observed over the period from 2018 to 2023 in quarters. Meanwhile, the profitability variable is identified as an intervening variable. The data employed in this study is cross-sectional in nature (comprising 105 conventional banks in Indonesia) and is recorded in the Indonesia Banking Statistics. Additionally, time-series data is available for the period 2018 to 2023 (five years).

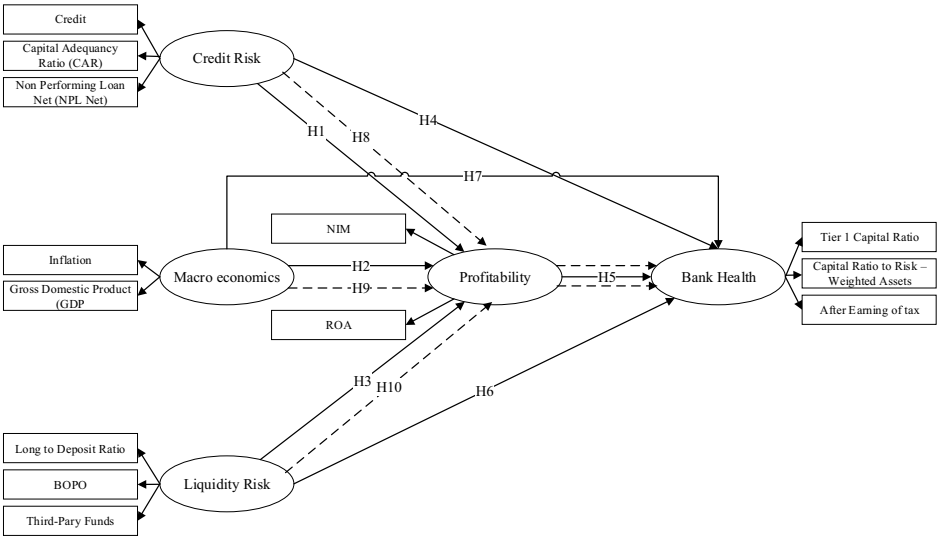

Fig 2. Research models (Source: Data processed 2024)

As illustrated in Figure 2, "in this study, structural equation modelling (SEM) was employed in conjunction with the Partial Least Square (PLS) computer programme. SEM is a series of statistical techniques that allow simultaneous testing of relatively complex sets of relationships (Ferdinand, 2014a). What is meant by complex is simultaneous models formed through more than one dependent variable at the same time acting as an independent variable for other cascading relationships.

4 RESULT

4.1 The Hypothesis Testing

After going through a series of necessary data quality tests, the following are the results of the hypothesis test, with a significant level of 10%, as seen in Tables 1 and 2.

Table 1. The Results of a Hypothesis Test of The Direct Effect

	H		Beta (original sample)	STDEV	T_{Stat}	PValues (1 Tail)	Decision
Credit Risk -> Profitability	H_1	- Sig	-0.251	0.305	0.822	0.206	Rejected
Macroeconomics -> Profitability	H_2	+ Sig	0.220	0.167	1.318	0.094	Accepted
Liquidity Risk -> Profitability	H_3	- Sig	-0.605	0.464	1.304	0.096	Accepted

Credit Risk -> Bank Health	H_4	- Sig	-1.117	0.146	7.654	0.000	Accepted
Profitability -> Bank Health	H_5	+ Sig	-0.338	0.207	1.635	0.051	Accepted
Liquidity Risk -> Bank Health	H_6	- Sig	-0.130	0.190	0.685	0.247	Rejected
Macroeconomics -> Health_Banks	H_7	+ Sig	-0.110	0.118	0.928	0.177	Rejected

Table 2. The Results of a Hypothesis Test of The Indirect Effect

			Beta (original sample)	**STDEV**	**T_{Stat}**	**PValues (1 Tail)**	**Decision**
Credit Risk -> Profitability -> Bank Health	H_8	+ Sig	0.085	0.137	0.617	0.135	Rejected
Macroeconomics -> Profitability -> Bank Health	H_9	+ Sig	-0.074	0.074	1.004	0.079	Accepted
Liquidity Risk -> Profitability -> Bank Health	H_{10}	+ Sig	0.205	0.199	1.026	0.077	Accepted

The results presented in the preceding table demonstrate that the ten hypotheses can be summarized as follows:

Hypothesis 1: Credit risk on profitability

Table 1 presents the results of the original sample, which yielded a value of -0.251, with a T-statistic of 0.822. This suggests that credit risk has a negative and non-statistically significant effect on profitability. As a result, H1 in this investigation is rejected. This suggests that profitability is unaffected by credit risk.

Hypothesis 2: Macroeconomics on profitability

Table 1 presents the results of the original sample (0.220), with a T-statistic of 1.318. This indicates that the impact of macroeconomic factors on profitability is significantly positive. Consequently, H2 is accepted in this study. This indicates that Macroeconomics does affect profitability.

Hypothesis 3: Liquidity risk on profitability

Table 1 presents the results of the original sample (-0.605), with a T-statistic of 1.304. This suggests that liquidity risk has a very detrimental effect on profitability. As a result, H3 is approved in this investigation. This suggests that profitability will rise in response to an increase in liquidity risk.

Hypothesis 4: Credit risk on bank soundness

Table 1 presents the results of the original sample (-1.117), with a T-statistic of 7.654. This suggests that credit risk has a detrimental effect on banks' overall health. As a result, H4 is

approved in this investigation. This suggests that a decrease in the soundness of banks is linked to an increase in credit risk.

Hypothesis 5: Profitability on bank health
Table 1 presents the results of the original sample, which yielded a value of -0.338, with a T-statistic of 1.635. "This indicates that the impact of profitability on bank health is significantly negative. Consequently, hypothesis H5 is accepted. This indicates that an increase in liquidity risk is associated with a decline in bank health. "

Hypothesis 6: Liquidity risk on bank health
Table 1 presents the results of the original sample, which yielded a value of -0.130, with a T-statistic of 0.685. This indicates that the impact of liquidity risk on the health of banks is negative and not statistically significant. Consequently, H6 is rejected in this study. This indicates that liquidity risk is unable to enhance the health of banks.

Hypothesis 7: Macroeconomics on bank health
Table 1 presents the results of the original sample, which yielded a value of -0.110 and a T-statistic of 0.928. This indicates that the impact of macroeconomic factors on the health of banks is not statistically significant. Consequently, H7 is rejected in this study. This indicates that macroeconomic factors are unable to enhance the health of banks.

Hypothesis 8: Credit risk on bank health with intervening profitability
Table 2 presents the results of the original sample (0.085) and the corresponding T-statistic (0.617). This indicates that the impact of credit risk on the health of banks through profitability is not statistically significant. Consequently, hypothesis H8 is rejected. This implies that an increase in credit risk through profitability variables is not associated with an increase in bank health.

Hypothesis 9: Macroeconomics on bank health with intervening profitability
Table 2 presents the results of the original sample, which yielded a value of -0.074, with a T-statistic of 1.004. This indicates that the impact of macroeconomic factors on the profitability of banks is significantly negative. Consequently, hypothesis H9 is rejected. This indicates that an increase in macroeconomic variables through profitability has a negative effect on bank health.

Hypothesis 10: Liquidity risk on bank health with intervening profitability
Table 2 presents the results of the original sample (0.205) and the T-statistic (1.026). This indicates that the impact of liquidity risk on the health of banks through profitability is statistically significant. Consequently, H10 is accepted in this study. This indicates that an increase in liquidity risk through profitability variables is associated with an improvement in bank health

4.2 Results of Descriptive Analysis of Work Discipline Variables

The first dimension of work discipline is Compliance with time rules, which consists of two statement items: I arrive at work on time before the set working hours and obtain a respondent response value of 90.83%. The second statement, I carry out work tasks until daily completion, got a respondent response value of 90.42%. In the second dimension, Compliance with service rules, there are two statements: I always wear work clothes or uniforms set by the company, obtaining a respondent response value of 81.25%. The second statement, namely I always comply with the company's operational standards (SOP) in doing work, obtained a respondent response value of 83.75%. The third dimension is Compliance with the code of ethics in the workplace. There are two statement items. Namely, I always do my duties responsibly, obtaining a respondent response value of 73.33%. The second statement, I maintain behavior according to applicable norms, got a respondent response value of 84.17%. The fourth dimension is obedience to other regulations. There are two statement items: I always obey the rules applied by the company, obtaining a respondent response value of 90.83%. The second statement that I understand and understand the controls and sanctions set by the company got a respondent response value of 90.42%. The eight statement items from the four dimensions of work discipline fall into the continuum line in the excellent category. This indicates that employees of PT Biro Arsitek and Insinjur Sangkuriang have done a good quality job, have obeyed the company's rules, and are always responsible for the tasks that the company has given.

5 DISCUSSION

5.1 The Effect of Credit Risk on Profitability

The t-statistic value of the effect of credit risk on profitability is 0.822, with an effect of -0.251 and a P-value > 0.10 of 0.206. It can therefore be concluded that the results of hypothesis testing demonstrate that credit risk, which is proxied by CAR, credit, and NPL net, has a negative and insignificant effect on profitability. This result is not consistent with the findings of previous research, which indicated that credit risk has a significant negative effect on profitability (Ariwidanata, 2016a; Mosey et al., 2018a). These results are also not in line with the theory put forward by Joseph et al. (2012), which states that the greater the non-performing loans contained in the bank, the lower the profitability generated by the bank and vice versa. Similarly, the theory proposed by Kasmir (2014b) posits that credit risk arises when a bank extends loans to customers for a specified period, yet the borrower is unable to repay the principal and interest on the agreed date. This can occur for a number of reasons, including, but not limited to: The credit risk that banks must assume has the potential to negatively impact their profitability, as they are unable to generate profits from the loans they have extended.

In this study, credit risk is represented by non-performing loans (NPLs). An increase in non-performing loans will result in higher costs for the bank, which may ultimately result in losses. Consequently, the bank's credit quality will deteriorate in conjunction with an elevated NPL ratio. Consequently, the number of non-performing loans will increase,

resulting in the bank bearing losses in its operations. This will result in a decrease in the profit (ROA) earned by the bank (Kasmir, 2004). However, the findings of this study are consistent with those of previous research (Capriani & Dana, 2019), which found that credit risk does not significantly affect profitability. Given that the credit risk experienced is minimal, an increase in credit risk has no impact on the level of profitability.

5.2 Macroeconomic Influence on Profitability

The t-statistic value of the macroeconomic effect on profitability is 1.318, with an effect of 0.220 and a P-value > 0.10 of 0.094. It can therefore be concluded that the results of hypothesis testing demonstrate that macroeconomic factors, proxied by inflation, have a significant positive effect on profitability. The findings of this study are consistent with those of previous research conducted by Singh et al. (2021). The term 'inflation' is defined as a condition that shows an increase in the general price level of goods that persists over a certain period (Nopirin, 2006: 25). As Sukirno (1994: 38) notes, an increase in inflation will result in a decline in economic growth, leading to an uptick in unemployment due to a lack of employment opportunities.

If the inflation rate is calculated based on general prices, then a high inflation rate will result in an increase in the interest rate on loans, an increase in production costs for producers or companies, and a decrease in people's purchasing power. Consequently, the elevated interest rate will impede investment in the development of productive sectors (Sukirno, 1994). Consequently, an increase in inflation will result in a reduction in the interest of investors in making investments, whereas a decline in inflation will lead to an increase in investment. Furthermore, in the event of an increase in production costs, the expenses of producers will also rise, which will result in a reduction of the workforce. Furthermore, should this situation persist, it is possible that producers may cease production for a period of time. Even if they are unable to keep up with the inflation rate, the producer's business may go bankrupt, which is a common occurrence among small entrepreneurs. Furthermore, high inflation results in a decline in the purchasing power of the general public.

5.3 Effect of Liquidity Risk on Profitability

The t-statistic value of the effect of liquidity risk on profitability is 1.304, with an effect of -0.605 and a P-value> 0.10 of 0.096. It can therefore be concluded that the results of hypothesis testing demonstrate that liquidity risk, which is proxied by BOPO, LDR and AL/DPK, has a significant negative effect on profitability. The findings of this study align with those of Nartaresa (2021). This research is also in accordance with the theory proposed by Dendawijaya (2009), which posits that the channeling of funds in the form of credit is riskier than deposits or public deposits in banks. Consequently, banks must assume this risk. Should the credit channel prove ineffective or encounter difficulties, the bank will find it challenging to return the funds deposited by the public. In this study, the Loan to Deposit Ratio (LDR) is defined as the ratio between the total loans granted by the bank and the funds received by the bank. This ratio is also a common method for measuring a bank's liquidity position or ability (Dendawijaya, 2009). This factor indicates the credibility and

capability of a bank. Some banking practitioners posit that the optimal safe limit for a bank's LDR is 80 per cent. Nevertheless, there is a degree of tolerance between 85% and 100% (Dendawijaya, 2009). The success of bank management is not contingent upon the level of its LDR. This may be due to the fact that the bank collects funds, or alternatively, may experience difficulty in channeling funds, thus resulting in a lack of profitability (ROA).

5.4 Effect of Credit Risk on Bank Health

The t-statistic value of the effect of credit risk on bank health is 7.654, with a large effect of -1.117 and a P-value> 0.10 of 0.000. It can therefore be concluded that the results of hypothesis testing demonstrate that credit risk, which is proxied by CAR, credit, and NPLnet, has a significant negative effect on bank health. The results of the study are consistent with those of previous studies which found that credit risk has a significant negative effect (Pratiwi, 2014; Puji Lestari, 2021). Theory posits that credit risk is calculated through the NPL ratio, which is a metric used to gauge the proportion of non-performing loans relative to the total credit extended by the bank. The effect of NPL on credit risk is positive, but an increase in credit risk will lower the bank's health score from the asset quality aspect, assuming that there are no other factors used by Infobank to influence the overall score. Consequently, NPL is a ratio employed to ascertain the proportion of non-performing loans relative to the total loans extended by the bank. The effect of NPL on risk (Damayanti & Chaniago, 2014).

5.5 Effect of Profitability on Bank Health

The t-statistic value of the effect of profitability on bank health is 1.635, with a large effect of -0.338 and a P-value > 0.10 of 0.051. It can therefore be concluded that the results of hypothesis testing demonstrate that profitability, as proxied by ROA, has a significant negative effect on profitability. Return on Asset (ROA) is a measure of the entity's ability to generate profits from all assets owned (Riyadi, 2016). It can be calculated by dividing profit before tax (after deducting tax) by average total assets (averaged over several years) multiplied by 100%. In this study, bank health is assessed based on after-tax earnings. Earning after tax is defined as the operating profit earned by the company after deducting income tax expense. In accordance with the definitions provided by Charles T. Horngren (1997), Earning After Tax (EAT) is defined as operating profit, plus non-operating income such as interest income, minus non-operating expenses such as interest expenses, minus corporate income tax. The impact of income tax is reflected in profit after tax (EAT), which may be considered a tax factor given that it incorporates the advantages of debt as a reduction in the tax burden.

5.6 Effect of Liquidity Risk on Bank Health

The t-statistic “value of the effect of liquidity on bank health is 0.685, with a large effect of -0.130 and a P-value>0.10 of 0.247. It can therefore be concluded that the results of hypothesis testing demonstrate that liquidity risk, as proxied by ALDPK, BOPO, and LDR,

has a negative and insignificant effect on bank health. The findings of this study are not consistent with the theoretical framework proposed by Damayanti and Chaniago (2014), which posits that LDR is a ratio that gauges a bank's capacity to fulfill its obligations upon the maturity of loans disbursed. The effect of LDR on liquidity risk is negative, but as liquidity risk decreases, the bank's health score from the liquidity aspect will increase, assuming there is no impact from other factors used in Infobank. This implies that the overall health score will increase. The BOPO ratio is a metric used to assess the effectiveness of a bank in reducing its operating costs in order to generate revenue. The effect of BOPO on bank operational risk is positive. Conversely, an increase in operational risk will result in a reduction in the health score from the efficiency aspect, assuming that other factors used in infobank have no effect. Consequently, the overall health score will also be reduced. Consequently, the impact of BOPO (0.782), ALDPK, and LDR on the bank health score is negative, whereas the influence of BOPO on liquidity risk is positive. The findings of this study diverge from those of the research conducted by Puji Lestari (2021).

5.7 Influence on Bank Health

The t-statistic value of the effect of macroeconomics on bank health is 0.928, with a large effect of -0.110 and a P-value > 0.10 of 0.177. It can therefore be concluded that the results of hypothesis testing demonstrate that macroeconomic factors, proxied by inflation, have a negative and insignificant effect on bank health. These results indicate that the bank has resilience with regard to capital adequacy. Capital adequacy is defined as the bank's capacity to withstand the risks inherent in its operations and to manage its assets in a manner that enhances its overall stability (Alper & Anbar, 2011). Consequently, even in the context of unstable inflation, the bank has demonstrated its ability to fulfill capital adequacy requirements. Furthermore, despite the economic turbulence that may be experienced in a given country, the bank's stability remains intact.

5.8 The Effect of Credit Risk on Bank Health with Intervening Profitability

The t-statistic value of the effect of credit risk on bank health is 0.617, with an effect of 0.085 and a P-value > 0.10 of 0.135. Thus, it can be said that the hypothesis testing findings show that credit risk—as measured by CAR, credit, and NPLnet—has an advantageous and negligible impact on bank health when used as an intervening variable in profitability factors. The findings of this research contradict the theoretical framework put forth by Puspitasari (2009) (in Avrita et al., 2016). This framework suggests that credit risk, measured in terms of non-performing loans (NPLs), is a ratio that characterizes a bank's capacity to handle NPLs as profitability, measured in terms of NIM and ROA, rises. According to this theoretical framework, the business will be able to pursue profits as profitability rises (Kasmir, 2014a).

The profit or net income generated by the company in the course of its operations. Profitability, also referred to as profit, is the income generated by a company minus the expenses and losses incurred during a specified reporting period. It is a ratio that indicates the relationship between profit and the assets or capital that generated the profit (Riyanto, 2011). It

is incumbent upon creditors and equity investors to analyse the profitability of a given enterprise. For equity investors, profit is one of the determinants of changes in the value of securities. Conversely, for creditors, profit is a source of interest and principal payments. The crucial aspect is not the absolute amount of profit generated by the company, but rather how the company can maximize profits for its shareholders.

Furthermore, this finding is at odds with the findings of Riadi (2014), which posit that non-performing loans (NPL) are situations where loan repayment agreements have the potential to fail and even potentially suffer losses. This may indicate that although a high level of non-performing financing will cause problems and simultaneously reduce the health of the bank in question, the health of the bank will improve when high profitability is achieved.

5.9 Macroeconomics on Bank Health with Intervening Profitability

The t-statistic value of the macroeconomic effect on bank health with intervening profitability is 1.004, with a large effect of -0.074 and a P-value> 0.10 of 0.079. It can therefore be concluded that the results of hypothesis testing demonstrate that macroeconomic variables, proxied by inflation, have a significant negative effect on bank health through the intervening variable of profitability.

5.10 Liquidity Risk on Bank Health with Intervening Profitability

The t-statistic value of the effect of liquidity risk on bank health with intervening profitability is 1.026, with an effect of 0.205 and a P-value > 0.10 of 0.077. Therefore, it can be said that the hypothesis testing findings show that, through the intervening variable of profitability, liquidity risk—as measured by BOPO and LDR—has a considerable positive impact on bank health. The results of this investigation support Kasmir's (2014a) claim that LDR is a ratio used to measure the percentage of credit given in relation to the quantity of public money and owned capital used. On the other hand, Dendawijaya (2009) asserts that LDR is a measure of how much lending to clients may compensate for the bank's duty to promptly grant depositors' requests to withdraw money that the bank has used to make loans.

6 CONCLUSION AND RECOMMENDATION

Conclusion

This research concludes that credit risk has a negative and insignificant effect on profitability, macroeconomics has a positive and significant effect on profitability, and Liquidity risk has a negative and significant negative effect on profitability. Credit risk has a negative and significant effect on bank health, profitability has a negative and significant effect on bank health, liquidity risk has a negative and insignificant effect on bank health, and macroeconomics has a negative and insignificant effect on bank health. By intervening with probability, credit risk has a positive and insignificant effect on bank health, macroeconomics has a negative and significant effect on bank health, and liquidity risk has a positive and significant effect on bank health.

Recommendation

Based on the conclusions above, this study recommends that:

1. In providing credit so that the risk can be minimized, then conduct a comprehensive credit analysis and strict supervision guided by the principle of prudence;
2. Increase profitability by approaching selecting good business sectors as target markets. So that the Bank is more responsive in overcoming the possibility of credit repayment by debtors who are experiencing difficulties;
3. Macroeconomic conditions marked by rising inflation which results in declining purchasing power of the community, require banks to channel credit to risky sectors, but still need to be vigilant.

REFERENCES

1. Ail Yadollahzadeh Tabari, N., Ahmadi, M., & Emami, someh. (2013). The Effect of Liquidity Risk on the Performance of Commercial Banks. In International Research Journal of Applied and Basic Sciences (Vol. 4, Issue 6).
2. Anam, A. K. (2013). Risiko Likuiditas Dan Dampaknya Terhadap Kinerja Perbankan Di Indonesia. Jurnal Dinamika Ekonomi Dan Bisnis, 10(1).
3. Athanasoglou, P. P., Delis, M., & Staikouras, C. (2022). Determinants of bank profitability in the South Eastern European region. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4163741
4. Baker, M. (2020). Strategic marketing planning in South Korea Finnish. The Marketing Manual, 9–24. https://doi.org/10.4324/9780080938714-5
5. Boffey, R., & Robson, G. N. (1995). Bank credit risk management. Managerial Finance, 21(1), 66–78.
6. Cisko, Š., & Klieštik, T. (2013). Finančný manažment II. Žilina: EDIS Publishers, University of Žilina.
7. Dendawijaya, L. (2014). Manajemen Perbankan (Ketiga). Jakarta: Ghalia Indonesia.
8. Djebali, N., & Zaghdoudi, K. (2020). Threshold effects of liquidity risk and credit risk on bank stability in the MENA region. Journal of Policy Modeling, 42(5), 1049–1063. https://doi.org/10.1016/j.jpolmod.2020.01.013
9. Ehrhardt, M. C., & Brigham, E. F. (2016). Corporate finance: A focused approach. Cengage learning.
10. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., Black, W. C., & Anderson, R. E. (2018). Multivariate Data Analysis. https://doi.org/10.1002/9781119409137.ch4
11. Kočenda, E., & Valachy, J. (2006). Exchange rate volatility and regime change: A Visegrad comparison. Journal of Comparative Economics, 34(4). https://doi.org/10.1016/j.jce.2006.07.003
12. Lubis, H. (2009). Pengaruh keahlian, independensi, kecermatan profesional dan kepatuhan pada kode etik terhadap kualitas auditor pada Inspektorat Provinsi Sumatera Utara. Universitas Sumatera Utara.
13. Martens, D., Baesens, B., & Gestel, T. Van. (2009). Decompositional rule extraction from support vector machines by active learning. IEEE Transactions on Knowledge and Data Engineering, 21(2). https://doi.org/10.1109/TKDE.2008.131
14. Mazreku, I., Morina, F., Misiri, V., Jonathan, & Grima, S. (2019). Exploring the Liquidity Risk Factors in the Balkan Region Banking System. European Research Studies Journal, XXII (Issue 1), 91–102. https://doi.org/10.35808/ersj/1409

15. Moradi, S., & Mokhatab Rafiei, F. (2019). A dynamic credit risk assessment model with data mining techniques: evidence from Iranian banks. Financial Innovation, 5(1). https://doi.org/10.1186/s40854-019-0121-9
16. Muranaga, G. F., & Ohsawa, H. (2002). Liquidity Risk and Performance in the Banking Sector. Finance Essay.
17. Nadia, S. (2010). Analisis Faktor-Faktor Yang Mempengaruhi Likuiditas Bank Syariah (Studi Kasus Bank Syariah Mandiri). Skripsi.
18. Nandadipa, S., & Prasetiono. (2010). Analisis Pengaruh Car, Npl, Inflasi, Pertumbuhan Dpk, Dan Exchange Rate Terhadap Ldr (Studi Kasus Pada Bank Umum di Indonesia periode 2004–2008). Universitas Diponegoro.
19. Pramana, K. M., & Artini, L. G. S. (2016). Analisis tingkat kesehatan bank (pendekatan RGEC) pada PT. Bank Danamon Indonesia Tbk. Udayana University.
20. Prasnanugraha P, P. (2007). Analisis Pengaruh Rasio-rasio Keuangan Terhadap Kinerja Bank Umum di Indonesia (Studi Empiris Bank-bank Umum Yang Beroperasi Di Indonesia). Program Sarjana Universitas Diponegoro.
21. Sangmi, D. M.-D., & Nazir, T. (2010). Analyzing Financial Performance of Commercial Banks in India: Application of CAMEL Model. Pakistan Journal of Commerce and Social Sciences, 4(1).
22. Santoso, T. B., & Triandaru, S. (2006). Bank dan Lembaga Keuangan Lain. Jakarta: Salemba Empat.
23. Setiawan, I. G. A. N. A. P., & Mahardika, D. P. K. (2019). Analisis Pengaruh Market To Book Value, Firm Size Dan Profitabilitas Terhadap Pengambilan Keputusan Lindung Nilai (Studi Kasus Pada Perusahaan Sub Sektor Otomotif Dan Komponennya Yang Terdaftar Di Bursa Efek Indonesia Pada Tahun 2014–2017). Jurnal Ilmiah Akuntansi, 4(1), 124–140. https://doi.org/10.23887/jia.v4i1.17055
24. Wuryandari, S., Dewi, R. R., & Siddi, P. (2020). Faktor-Faktor Yang Mempengaruhi Profitabilitas Perusahaan Otomotif Yang Terdaftar Di Bei Periode 2012-2018. Accountia Journal (Accounting Trusted, Inspiring, Authentic Journal), 4(01), 47–59.
25. Zhang, H., Yuan, X., & Song, T. H. (2020). Examining the role of the marketing activity and eWOM in the movie diffusion: the decomposition perspective. Electronic Commerce Research, 20(3), 589–608. https://doi.org/10.1007/s10660-020-09423-2
26. Zhu, Y., Xie, C., Sun, B., Wang, G. J., & Yan, X. G. (2016). Predicting China's SME credit risk in supply chain financing by logistic regression, artificial neural network and hybrid models. Sustainability (Switzerland), 8(5). https://doi.org/10.3390/su8050433.

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