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Determinants of sustainable growth of commercial banks: Does lending growth matter?

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ABSTRACT

This study addresses a crucial aspect of the banking sector, sustainable growth, which is vital for the long-term viability of banks yet has rarely been studied. This study examines the factors affecting the sustainable growth of commercial banks and whether lending growth matters. The study uses panel data regression method with the generalized least squares and generalized method of moments with secondary data from the entire population of all listed commercial banks in Indonesia for the years 2013-2022 with a total of 399 observations. The novelty of this research is to examine the determinants of sustainable growth of commercial banks in Indonesia, including the lending growth encompassing periods of prior, during, and post-pandemic COVID-19. The results show that previous sustainable growth significantly influenced current sustainable growth, banking performance, lending growth, and capital, whereas liquidity and inefficiency had negative impacts. Contrary to previous research, loan quality had an insignificant effect, which was due to the new relaxation policy by the Indonesian Financial Services Authority to lessen the pandemic COVID-19 impact until 2024. Banks and regulators should understand the determinants of sustainable growth and be mindful of the adequacy of loan loss provision expense since it is not as ample as prior to the relaxation policy period. Future research to expand to ASEAN countries is recommended since the loans-to-GDP ratio in Indonesia is quite low and to understand the effect of different relaxation policies by different regulators.

Contribution/Originality: This study is one of the very rare studies to analyze the determinants of sustainable growth for commercial banks in a rapidly growing economy in ASEAN, such as Indonesia, using static methods, generalized least squares, and generalized methods of moments for more robust and reliable results. This study is the first to examine the effect of lending growth on sustainable growth in commercial banks.

1. INTRODUCTION

Higgins (1977) introduced sustainable growth as the maximum growth rate that companies can maintain without additional equity financing while maintaining financial leverage (Ashta, 2008; Fonseka, Ramos, & Tian, 2012; Higgins, 1977). The importance of sustainable growth is more apparent in the post-COVID-19 era, when companies tend to rely on internal financing and when market liquidity is not conducive for banks to obtain new equity to grow (Altig et al., 2020; Boubaker, Le, & Ngo, 2023).

Sustainable growth is one simple integrated financial performance that includes the combination of operational aspects such as profitability and asset turnover with financial aspects such as capital structure and retention ratio. The comprehensive sustainable growth metric has the potential to enhance companies value (Amouzesh, Moeinfar, & Mousavi, 2011; Higgins, 1977). Sustainable growth can also identify early signs of an impending bank failure, which correlates growth with financial performance. These signals may also reveal specific areas of concern for closer monitoring (Zheng & Escalante, 2020).

A country's banking system is important for economic growth, financial stability, competitiveness, and development of the manufacturing and service sectors (Lipcyznski, Wilson, & Goddard, 2017). These observations prompted inquiries into how Indonesian banks can uphold sustainable growth and resilience. In addition to the above, to the best of our knowledge, there was no research studying the determinants of sustainable growth for commercial banks in Indonesia. Understanding the importance of commercial banks in Indonesia is crucial to finding out the determinants of sustainable growth for commercial banks in Indonesia.

While sustainable growth metrics are important, they are underappreciated and underresearched. It is not just a simple integrated number encompassing financial and operational metrics of the bank, but it serves the growth rate to which a company should pay attention in terms of unavailability of raising additional new equity in the case the market is not conducive for external equity financing. Sustainable growth aligns with pecking order hypothesis, implying that issuing new stocks could signal a deficiency in internal finances and potentially hinder the ability to secure additional debt. Therefore, the ability to generate profits closely correlates with internal finance (Damodaran, 2015).

Previous studies on sustainable growth in banks within the Association of Southeast Asian Nations (ASEAN) countries on risks had been conducted (Isnurhadi, Saftiana, & Jie, 2022) however, the study caters for different research, i.e., risks on sustainable growth, not focusing on determinants of sustainable growth. Previous investigations have shown the influence of bank-specific characteristics on sustainable growth. Several researchers have analyzed factors such as profitability, retention, asset turnover, and leverage (PRAT) (Altahtamouni, 2023; Higgins, 1977; Vasiliou & Karkazis, 2002). On top of these factors, research has been conducted on the non-PRAT bank-specific characteristics of sustainable growth, such as liquidity, asset quality, capital, and inefficiency with inconsistent results regarding these drivers' effects on sustainable growth. Inconsistent results and absence of research on the impact of lending growth on sustainable growth drive this research encompassing prior, during, and after pandemic COVID-19. There are very limited studies on sustainable growth for commercial banks in Indonesia, the largest economy in Southeast Asian countries, with only a few available (Junaidi, Sulastri, Isnurhadi, & Adam, 2019; Pratama, 2019).

The sustainability of commercial banks is important for their role as financial intermediaries and for the economy. Commercial banks in Indonesia play a significant role as a financial intermediaries. The untapped market for the Indonesian banks consists of 60 million ultra-micro and micro businesses, which represent 60% of the Gross Domestic Product (GDP), with traditional banks being the primary financial provider (Wiradharma, 2023). Banks primarily rely on lending for financial intermediation. With the slower economy due to COVID-19 pandemic, less lending growth will surely affect financial intermediation functions by banks. Yet, previous literature does not consider the effect of lending growth on sustainable growth for commercial banks.

Adegbie and Dada (2018) found that liquidity was the most determinant factor for sustainable growth, but conflicting results were shown by Atahau and Cronje (2019); Chen, Shen, Kao, and Yeh (2018); Junaidi et al. (2019); Kessy, Mayala, and Taya (2021) and Pratama (2019) who presented a significant negative effect of liquidity on sustainable growth. The sustainability of banks' operations depends on their ability to generate healthy earnings. However, focusing on mere lending growth while neglecting loan quality would definitely lead to losses surpassing booked interest revenue, while asset quality may take time to deteriorate. Isnurhadi et al. (2022) and Kessy et al. (2021) identified a significant negative effect of low loan quality on sustainable growth.

Lending growth contributes to financial intermediation functions of commercial banks. Banks expect to generate positive earnings from the financial intermediation. Banks with high lending growth are expected to have a higher net interest income and other revenues resulting from the lending. It is expected to have higher return on equity and better sustainable growth.

During a crisis such as pandemic COVID-10, the country's economic growth is affected, and sustainable growth for commercial banks would be affected as well. Indonesia Financial Services Authority issued the relaxation policy in 2020 to protect the economy and banks; otherwise, financial intermediary functions will be disrupted and bank performance will be affected as well.

With the slower economy due to COVID-19 pandemic, less lending growth will surely affect financial intermediation functions by banks, and sustainable growth would be affected as well. This research also highlights the crucial role of regulators in mitigating the adverse impact of COVID-19 on macroeconomics, particularly for commercial banks that serve as intermediaries in the economy.

The novelty of this research is to examine the determinants of sustainable growth of commercial banks and whether lending growth matters. Nguyen and Dang (2020) posited a positive association between robust asset quality and lending growth in Vietnam and showed that banks with low loan quality may inhibit providing additional loans. This was supported by Le (2020) who found that performance was positively associated with lending growth, but trade-off advantages existed with large lending growth. Conversely, Sobarsyah et al. (2020) concluded that increased lending growth can exacerbate credit risk, especially for banks with ample capital bases allowing further expansion. Empirical studies showed that lending growth increased credit risk and influenced loan quality. Moreover, it contributed to the financial intermediation functions of commercial banks to the society, with loans as the biggest proportion of the assets (Beatty & Liao, 2014) with banks expecting to generate good earnings.

Five distinct sections organize this paper. The first section serves as a beacon of clarity, emphasizing the purpose, historical context, existing literature, gaps, and objectives. The second section provides the literature review, establishing a robust theoretical framework with an empirical study model and key variables while developing hypotheses. Meanwhile, the third section defines the study type, relevant variables, measurements, and statistical analyses underpinning the empirical study. The fourth section presents the results, and the conclusion summarizes the findings, limitations, and recommendations.

2. LITERATURE REVIEW

Banks are intermediaries that obtain funding from customers, investors, and become relationship lenders (Diamond, 1984). In the mean time, sustainable growth rate is critical for businesses, serving as a measure of corporate success and enabling shareholders to manage their equity (Zheng & Escalante, 2020). Moreover, the sustainable growth model was established in the corporate finance literature by Higgins (1977) with a growth target that is within certain operating and financial parameters as "growing within one's means." Companies with significant growth rates often face financial difficulties such as excessive costs, increased debt, insolvency, and reduced market share (Mamilla, 2019).

Despite the evident importance of lending growth, the banking sector has yielded conflicting results. Lending growth positive impact on bank performance was reported by Dang (2019); Islam and Nishiyama (2016) and Rachman, Kadarusman, Anggriono, and Setiadi (2018). Other studies showed that rapid loan growth negatively impacted performance due to the low quality of loans booked (Bhowmik & Sarker, 2021; Fahlenbrach, Prilmeier, & Stulz, 2016; Rachman et al., 2018; Thiong'o, Kilungu, & Kamau, 2024). This was in line with the studies on Indian commercial banks, where the lending growth exerted a diminishing impact on profitability (Satya Krishna Sharma, Bijoy, & Sahay, 2022).

Research also revealed that banks often boost their capital ratios by decreasing their assets and slowing down lending growth, particularly following a recession. In contrast, Malovaná and Ehrenbergerová (2022) showed higher

capital had a negative effect on lending growth, while Abbas and Ali (2022) found that capital positively moderated the relationship between lending growth and loan quality. This was in line with the regulatory hypothesis concerning the positive effect of capital on banks' risk-taking.

While there is abundance of study in the field of bank performance, there is limited literature on the determinants of sustainable growth, especially in Indonesia.

2.1. The Effect of Bank Performance on Sustainable Growth

Bank performance reflects the ability to generate earnings relative to expenses and has become the primary focus of stakeholders (Nguyen & Dang, 2020). High profitability indicates the capability to generate sufficient profit to strengthen capital, providing a stable foundation for sustainable growth. With strong capital, banks can expand aggressively, allocate more resources to long-term growth-supporting investments, and manage potential risks better (Altahtamouni et al., 2022; Amouzesh et al., 2011; Isnurhadi et al., 2022). Isnurhadi et al. (2022) calculates net profit margins (NPM) as the income from revenue or operations. Previous investigations have shown the positive influence of performance on sustainable growth, including (Altahtamouni et al., 2022; Isnurhadi et al., 2022; Junaidi et al., 2019; Kessy et al., 2021; Zheng & Escalante, 2020).

H_1: Bank performance has a positive effect on sustainable growth.

2.2. The Effect of Liquidity on Sustainable Growth

According to Golubeva, Duljic, and Keminen (2019) and Rosyid and Irawan Noor (2018) liquidity, represented by the loan-to-deposit ratio, indicates the extent to which banks can invest in loans derived from the funding received from deposits. A higher loan deposit rate represents better financial intermediation but lower liquidity due to investment of funds in loans from deposits gathered, with the expectation of generating higher profitability in return. Conversely, banks have a low loan-to-deposit ratio when there are more deposits than loans. These findings were validated by Abbas, Iqbal, and Aziz (2019) and Teresienė, Keliuotytė-staniulėnienė, and Kanapickienė (2021). Banks have adequate liquidity when investment in assets does not hinder the ability to pay the required commitments due (Adelopo, Vichou, & Cheung, 2022; Osazefua Imhanzenobe, 2020).

Research on the impact of liquidity on bank performance and sustainable growth has been inconsistent. Liquidity may have a positive influence but no significant effect on bank performance (Islam & Nishiyama, 2016) and a negative relationship with it (Chen et al., 2018; Saleh & Abu Afifa, 2020). However, other research proves that banks that need liquidity may have to pay a premium price to secure third-party funds and a higher price for issuing bonds. This aligns with Oino (2021) findings regarding the detrimental effects of increased liquidity on banking performance. Negative effect on liquidity on bank performance; there are no possible explanations with the coefficient being quite small (Atahau, Dorkas, & Cronje, 2022).

A negative and significant effect of liquidity on sustainable growth was observed as the biggest risk experienced by banks in various ASEAN countries (Isnurhadi et al., 2022). No significant effect on liquidity on banking performance for all percentiles, with a positive insignificant effect on lowest (<30th percentile), and highest (>70th percentile) while a negative insignificant effect on the medium percentiles (Linggadjaya, Atahau, Ugut, & Kim, 2024).

Liquidity had a significant positive effect on sustainable growth (Isnurhadi et al., 2022; Mamilla, 2019). It is in line with the rationale that the higher LDR means higher loans compared to deposits, which may translate to higher interest income compared to interest expense, resulting in higher bank performance and subsequently higher sustainable growth. However, it was not the case noted by Junaidi et al. (2019); Kessy et al. (2021) and Pratama (2019). The higher LDR means the lower liquidity in the bank as more funds are locked into the loan book compared to its deposit. This may serve as opportunity loss when better lending opportunities occur and present higher liquidity risk for sustainable growth, which was the basis of this hypothesis.

H_2: Liquidity has a negative effect on sustainable growth.

2.3. The Effect of Lending Growth on Sustainable Growth

Lending growth contributes to financial intermediation functions of commercial banks. These banks expect to generate substantial earnings from the financial intermediation. Banks with high lending growth are expected to have higher net interest income and other revenues resulting from the lending. It is expected to have a higher return on equity and better sustainable growth.

As a financial intermediary that gathers deposits to lend credit, banks generate money from scratch when providing a loan, which is known as credit creation hypothesis (Werner, 2016). Protecting financial intermediary functions and profitability is crucial, especially as technology companies disrupt the intermediation functions (Broby, 2021). Banks only maintain a fraction of customer deposits in the reserve and lend most funds, functioning as the 'money multiplier' in the country's economy (Buchak, Matvos, Piskorski, & Seru, 2024).

The positive effect of lending growth on performance has been reported by Dang (2019); Islam and Nishiyama (2016) and Rachman et al. (2018). As banks experience lending growth, income from loans and non-loan-related fees might increase, leading to increased profitability and might contribute to sustainable growth. However, fast lending growth has been found to negatively impact performance, according to Bhowmik and Sarker (2021); Fahlenbrach et al. (2016) and Thiong'o et al. (2024) reports. In the absence of prior investigation into the effects of lending growth on sustainable growth, the following hypothesis was considered.

H_3: Lending Growth has a positive effect with sustainable growth.

2.4. The Effect of Loan Quality on Sustainable Growth

Loans make up the majority of banks assets, with loan loss provisions (LLPs) being the largest (Beatty & Liao, 2014). Loan quality had a negative and significant effect on performance (Adelopo et al., 2022; Atahau et al., 2022; Karamoy & Tulung, 2020). Loan quality has a significant negative impact on sustainable growth (Isnurhadi et al., 2022; Junaidi et al., 2019; Kessy et al., 2021; Pratama, 2019). LLPs serve as an indicator of anticipated losses (Ng, Saffar, & Zhang, 2020). While LLPs are the largest individual accrual made by banks, as shown by Beatty and Liao (2014), they also demonstrated significant variability over time (Beatty & Liao, 2011). The IFRS implementation has enhanced the predictive capacity of LLPs (Gebhardt & Novotny-Farkas, 2018).

High-quality loan contributes to interest revenue (a proportion of the loan), while a poor-quality loan might impact the full amount. When the borrowers fail to pay back, banks will not only suffer from interest income but, most importantly, lose the funds lent to the borrowers. In this context, loan quality reflects the credit risks faced as a result of the loan book (Kessy et al., 2021). Credit risk was reported as the highest risk in banks (Guzel, 2021), and it negatively influenced profitability (Gadzo, Kportorgbi, & Gatsi, 2019).

LLPs present difficulties for investors in comprehending the actual value of the provided information (Wahlen, 1994). Therefore, excessive LLPs in one period are rectified by decreasing them in subsequent periods. The association between LLPs and future stock returns will also show corresponding variations (Beatty & Liao, 2021). Moreover, LLPs are dependent on regulations and macroeconomic environments (Gao, Lim, Liu, & Zeng, 2022). The predicted credit loss model aimed to address the shortcomings of the incurred loss model and enhance the predictability of loan loss estimations (Kyiu & Tawiah, 2023).

H_5: Loan quality has a negative effect with sustainable growth.

2.5. The Effect of Inefficiency on Sustainable Growth

Banks improve efficiency when they increase operating income relative to operational costs. This means that when the banks can lower operating costs, higher efficiency can be achieved. Cost and profit efficiency have originated as the most crucial assumptions for sustainability. Certain key factors influence inefficiency, such as the cost-income ratio (Torre Olmo, Cantero Saiz, & Sanfilippo Azofra, 2021). Efficiency is only slightly significant during global financial crises (Mateev, Sahyouni, & Al Masaeid, 2024), while inefficiency has a significantly negative effect on

performance (Linggadjaya et al., 2024; Nasim, Nasir, & Downing, 2024; Ruslan, Pahlevi, Alam, & Nohong, 2019). Similarly, Junaidi et al. (2019) and Kessy et al. (2021) showed the significant negative effect of inefficiency on sustainable growth.

H_5: Efficiency has a negative effect with sustainable growth.

2.6. The Effect of Capital on Sustainable Growth

A capital adequacy ratio higher than the minimum level specified by regulators indicates capital strength. Well-capitalized banks can seize opportunities with a capital base above the minimum requirements. The larger the capital, the better the capacity for unexpected losses that may occur (Gupta & Mahakud, 2020). In this context, capital had a significant positive effect on performance (Huy, Nga, & Tam, 2024; Livoreka & Grajçevci-Livoreka, 2023; Rosyid & Irawan Noor, 2018). This was supported by Dao (2020), who showed a positive relationship between ROA and a negative relationship with return on equity and the importance of maintaining a certain level of capital to prevent bankruptcy. However, Atahau and Cronje (2019) and Yahya, Akhtar, and Tabash (2017) concluded that capital had no impact on performance, and Hersugondo, ANJANI, and Pamungkas (2021) stated that CAR had a significant negative effect on performance.

Few studies have examined the effect of capital on sustainable growth. The study by Nor, Shaharuddin, Nawai, and Abdullah (2017) on risk management practices revealed that Islamic banks exhibit a higher risk weighted capital ratio (RWCR) was noted in Islamic banks towards sustainable growth. Improved capital allocation efficiency has a positive effect on sustainable growth (Louri & Migiakis, 2019).

H_6: Capital has a positive effect with sustainable growth.

3. MODELS, METHODOLOGY AND DATA

3.1. Research Model

This study used panel data regression to evaluate the hypotheses. To determine the best model, several methods were analyzed. Firstly, a static panel analysis was conducted to determine the best model between the fixed- and random-effect models. The F-test, Breusch-Pagan Lagrange multipliers were then conducted (Breusch & Pagan, 1980) and Hausmann test (Hausman, 1978). The F-test used to compare the best between OLS-based and fixed models and its significant result (p-value less than 0.05) showed that the fixed model was more suitable. Then the Breusch-Pagan Lagrange multipliers test was conducted, and its significant result (p-value less than 0.05) showed that the random model was more appropriate than the OLS-based. Subsequently, the Hausman test was conducted to select the best model between fixed and random model, and its significant result (p-value less than 0.05) showed that the random model was the best model for static panel analysis.

Subsequently, to ensure the robustness of the results, assumptions of non-autocorrelation and homoscedasticity were then evaluated. The non-autocorrelation assumption test was conducted using the Breusch-Godfrey/Wooldridge test, with a non-significant result expected (p-value more than 0.05) to confirm non-autocorrelation (Godfrey, 1996). Homoscedasticity test was conducted using Breusch-Pagan test, with a non-significant result expected (p-value more than 0.05) to confirm that the model was free from heteroscedasticity. When all the assumptions were satisfied, then the model was considered robust.

However, the use of static models focused only on the relationship between variables at a given point in time without considering the impact of past values of the dependent variable, potentially causing bias due to residual error (Arellano & Bond, 1991; Wooldridge, 2001). In addition to the potential bias, the possibility of cross-sectional heteroscedasticity and autocorrelation may exist. If such condition occurs, a second method that accommodates a more robust and reliable results will be conducted, such as generalized least squares (GLS) and generalized method of moments (GMM) (Dietrich & Wanzenried, 2011). Baltagi, Song, Jung, and Koh (2007) conducted a comparison between the GLS and GMM methods to address potential heterogeneity and autocorrelation issues. The GLS model

provided higher power and shorter confidence intervals compared to the OLS-based model (Hansen, 2007) while GMM model simultaneously alleviated any potential endogeneity issue.

For the GMM model, this study implemented the Arellano-Bond linear dynamic panel estimation method (Arellano & Bond, 1991; Arellano & Bover, 1995). This method effectively managed individual-specific effects, alleviated unobserved heterogeneity concerns, rectified the biases stemming from omitted variables, and eliminated any correlation between the error term and independent variables. Then, additional tests were conducted to determine the appropriate GMM method. First, serial correlation in the error terms was evaluated using (Arellano & Bond, 1991) test. The null hypothesis, indicating no serial correlation in the error terms should not be rejected. Therefore, the expected result is non-significant (p-value greater than 0.05) (Baltagi, 2013). Second, the Sargan Test assessed the validity of the instruments or overidentifying restrictions (Sargan, 1958). Rejection of the null hypothesis suggested that overidentifying restrictions are invalid, with an anticipated result of a non-significant result (p-value more than 0.05). When both tests supported the null hypothesis, the first-differences GMM (FD-GMM) was utilized; otherwise, the system GMM (SYS-GMM) model was employed. The Durbin-Wu-Hausmann test was used to evaluate endogeneity. A significant test result (p-value less than 0.05) showed the existence of endogeneity in the model. When endogeneity exists, then the use of GMM model is more suitable.

The following equations illustrate the developed conceptual model.

(1) Static & GLS model:

$$SGR_{i,t} = \beta_0 + \beta_1 NPM_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 LGROW_{i,t} + \beta_4 INEF_{i,t} + \beta_5 CAP_{i,t} + \beta_6 LQ_{i,t} + \beta C_{i,t} + \varepsilon_{i,t} \quad (1)$$

(2) Dynamic GMM model:

$$SGR_{i,t} = \beta_0 + \beta_1 SGR_{i,t-1} + \beta_2 NPM_{i,t} + \beta_3 LIQ_{i,t} + \beta_4 LGROW_{i,t} + \beta_5 INEF_{i,t} + \beta_5 CAP_{i,t} + \beta_6 LQ_{i,t} + \beta C_{i,t} + \varepsilon_{i,t} \quad (2)$$

where β is the coefficient, t is time (year), i is bank, ε is the error term, and C is the vector of control variables.

3.2. Data Samples

The research will include 106 commercial banks in Indonesia by the end of 2022. Since sustainable growth rate measurement required retention of earnings information, which was only available annually in listed commercial banks, the study could only be conducted for the entire listed commercial banks. The listed commercial banks in Indonesia, which reached forty-seven banks from 2013 to 2022, were selected with a total of three hundred ninety-nine observations. The total assets, loans, net income, and market capitalization constituted 87%, 88%, 95%, and 100% of all entire commercial banks in Indonesia.

The period selected for this research is from 2013 to 2022, which covers the period prior to, during, and after Pandemic COVID-19. Pandemic COVID-19 is an unanticipated and sudden pandemic event with significant negative impacts to the economy and sustainable growth of banks.

The study used the financial year 2013 as the starting year post-financial crisis of 2008 and the financial year 2022 to present the latest available financial data.

3.3. Variables

Banks-specific characteristics were acquired from audited financial statements of Indonesian listed commercial banks between 2013 and 2022, and data on macroeconomic variables were obtained from the Indonesia Stock Exchange.

This study included six independent variables representing bank-specific characteristics, where one variable assumed a dependent variable and three controls, including bank size (total assets) and macroeconomic factors such as GDP growth and interest rates. Table 1 presents a summary of the variables and measurements.

Table 1. Variables and their measurements.

Variable	Proxy	Formulation	Reference	Expected sign
Sustainable growth	Sustainable growth rate (SGR)	$Return\ on\ average\ equity\ x\ (1 - dividend\ payout\ ratio)$	Altahtamouni et al. (2022); Isnurhadi et al. (2022) and Zheng and Escalante (2020)	(+)
Bank performance	Net profit margin (NPM)	$\frac{Net\ income}{Operating\ income}$	Altahtamouni et al. (2022) and Zheng and Escalante (2020)	(+)
Liquidity	Loan deposit ratio (LDR)	$\frac{Loans}{Total\ deposits}$	Isnurhadi et al. (2022); Kessy et al. (2021) and Mamilla (2019)	(-)
Lending growth	Lending growth (LG)	$\frac{Gross\ loans_t - Gross\ loans_{t-1}}{Gross\ loans_{t-1}}$	Abbas and Ali (2022); Dang (2019); Saif-Alyousfi (2022) and Tölö and Virén (2021)	(+)
Inefficiency	Cost to income ratio (INEF)	$\frac{Operating\ Eexpense}{Operating\ income}$	Isnurhadi et al. (2022) and Kessy et al. (2021)	(-)
Capital	Capital adequacy ratio (CAP)	$\frac{Total\ capital}{Total\ risk\ weighted\ assets}$	Huy et al. (2024); Le (2020) and Kassem and Sakr (2018)	(+)
Loan quality	Loan loss provision expense (LQ)	$\frac{Loans\ Provision\ (P\&L)}{Gross\ loans}$	Chen, Emanuel, Li, and Yang (2021); Dao (2020) and Natufe and Evbayiro-Osagie (2023)	(-)
Control variable				
Banks size	Ln of total asset	$Ln\ of\ total\ assets$	Grželeta, Žiković, and Tomas Žiković (2023); Nguyen (2023) and Quy and Tuan (2024)	n.a.
GDP growth	GDP growth	$\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$	Aziz and Maulida (2024); Nasim et al. (2024) and Quy and Tuan (2024)	n.a.
Interest rate	Interest rate	$BI\ Rate\ or\ BI\ 7\ days\ repurchase\ rate$	Faheem, Zia, Raza, and Khan (2024); Quy and Tuan (2024) and Topbie, Ibiwari, and Nwankwo (2022)	n.a.

3.4. Robustness Checking

Lu and White (2014) used a proxy selection method to further analyze the robustness of the relationship between independent and dependent variable. This step aims to achieve robust and consistent outcomes. Proxy variables for loan quality were substituted with non-performing loan (NPL). Moreover, the extent of changes in the estimated regression coefficient was evaluated when there were changes in the model specifications. Subsequently, a comparison of the coefficient estimations was conducted (Lu & White, 2014).

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The study uses a total of unbalanced 399 observations from the population of 47 listed commercial banks from 2013 to 2022, as shown in Table 2. As seen in the table, several variables have wide range of values. The sustainable

growth rate ranged from -49.43% to 19.51%, with an average of 2.15% and a standard deviation of 12.64%. Similarly, the NPM varied from -295.63% to 46.85%, with an average of -1.51%, and a high standard deviation of 68.71%. The lending growth ranged from -29.02% to 109.31%, with an average of 12.40% and a standard deviation of 22.84%.

The Shapiro-Wilk test was used to evaluate the distribution normality for each variable. Table 2 presents the distribution for all variables was not normal. All p-values of the Shapiro-Wilk test were significant; therefore, the null hypothesis that data were evenly distributed was rejected. This was understandable given the wide range of data and outliers. Consequently, the median value for yearly distributions for all variables is used, as demonstrated in Figure 1.

Table 2. Descriptive statistics and normality test.

Variable	N	Mean	Standard deviation	Min.	Max.	Range	Normality test p-value
Sustainable growth (SGR)	399	2.15	12.64	-49.43	19.51	68.94	0.00
Bank performance (NPM)	399	-1.51	68.71	-295.63	46.85	342.48	0.00
Liquidity (LIQ)	399	86.09	18.76	47.29	146.09	98.8	0.00
Lending growth (LGROW)	399	12.40	22.84	-29.02	109.31	138.34	0.00
Inefficiency (INEF)	399	92.65	28.34	55.97	217.66	161.7	0.00
Capital (CAP)	399	25.1	14.77	11.42	91.65	80.23	0.00
Loan quality (LQ)	399	2.94	2.37	0.17	10.92	10.76	0.00
Banks size (SIZE)	399	17.48	1.7	14.65	21	6.34	0.00
GDP growth (GDPG)	399	4.19	2.23	-2.07	5.56	7.62	0.00
Interest rate (IR)	399	5.4	1.46	3.5	7.75	4.25	0.00

Note: All values are in percentage except for column n and normality test p-value.

Table 3. Bivariate correlation results and variance inflation factors.

Variable	SGR	NPM	LIQ	LGGROW	INEF	CAP	LQ	SIZE	GDPG	IR	VIF
SGR	1.000										-
NPM	0.885**	1.000									5.697
LIQ	0.021	-0.021	1.000								1.082
LGGROW	0.230**	0.200**	0.185**	1.000							1.208
INEF	-0.868**	-0.900**	-0.006	-0.178**	1.000						6.071
CAP	-0.074	-0.104*	0.156**	0.135**	0.121**	1.000					1.426
LQ	-0.366**	-0.410**	-0.038	-0.286**	0.347**	0.186**	1.000				1.736
SIZE	0.357**	0.277**	0.029	-0.067	-0.392**	-0.320**	0.217**	1.000			1.346
GDPG	0.101*	0.110*	0.030	0.174**	-0.095*	-0.095*	-0.226**	-0.012	1.000		1.739
IR	0.197**	0.157**	0.054	0.190**	-0.161**	-0.269**	-0.321**	-0.003	0.495**	1.000	1.522

Note: *p<0.05; **p<0.01.

Table 3 illustrates the use of Pearson correlation to assess the relationship between the explanatory and dependent variables. A positive significant correlation existed between performance and lending growth, while a negative correlation existed between inefficiency and loan quality with sustainable growth at 1% significance level. However, the correlation between liquidity and capital with sustainable growth was found to be insignificant.

It was important to assess the presence of multicollinearity. This study used the variance inflation factor (VIF) to assess multicollinearity. The result of the collinearity test showed that the VIF value ranged between 1.08 (liquidity) and 6.07 (inefficiency). In addition, all VIF values were less than 10, signifying that the model did not suffer from multicollinearity.

4.2. Regression Results – First Method (Static Method)

The Hausman test estimation results for the first model, a static panel, suggested a p-value (0.000) with a test statistic of 95.78, leading to rejection of the null hypothesis. This implied that the fixed effect model was appropriate for this study. Moreover, the Breusch–Pagan Lagrange multiplier test for random effects showed a test statistic of 2.454 and a p-value of 0.117, and the null hypothesis that the pooled estimator was more appropriate was accepted. The F-test results suggested that the fixed effect was more appropriate than the pooled effect model, with a p-value of 0.000 (F = 2.68). Even though the fixed effects model was the best estimator for the static model, heteroscedasticity and autocorrelation existed within it. The result of the Breusch-Pagan test showed statistics of 465.16 with a p-value = 0.000, concluding the existence of heteroscedasticity. The Breusch-Godfrey/Wooldridge also confirmed the existence of autocorrelation with statistics of 17.136 and a p-value = 0.000. These results concluded that the static panel model was not appropriate. Therefore, the second approach model with GLS and GMM methods was exercised.

4.3. Regression Results – Second Method (GLS and GMM)

To control the violation of the assumptions, GLS and GMM methods were compared. For the GLS model, the Wald test showed a model fit with a pseudo-R2 of 0.879. The Wald chi-square test and Sargan test for GMM models showed that the model fit, and there was no second-order autocorrelation. This proved that the model's moment conditions were correct (Arellano & Bover, 1995). These steps ensured the robustness of the GMM estimations and the unbiasedness of the standard errors. In terms of the dynamic model, the FD GMM satisfied the goodness of fit. Table 4 presents the results.

Table 4. Estimation results.

Variable	GLS	FD GMM
Independent variable:		
Lagged sustainable growth	-	-0.089*
Bank performance (NPM)	0.075***	0.070***
Liquidity (LIQ)	-0.021	0.088**
Lending growth (LGROW)	0.014*	0.056**
Inefficiency (INEF)	-0.210***	-0.248***
Capital (CAP)	0.047***	0.107*
Loan quality (LQ)	-0.424***	-0.089
Control variable:		
Banks size (SIZE)	-2.013***	-7.182***
GDP growth (GDPG)	-0.160***	0.002
Interest rate (IR)	0.204	-0.221
Observations	399	352
Pseudo R^2	0.879	-
Wald p-value	0.000	0.000
Sargan p-value	-	0.171
AR(1) p-value	-	0.097
AR(2) p-value	-	0.658

Note: *p<0.1; **p<0.05; ***p<0.01.

The endogeneity test using the Durbin-Wu-Hausman obtained a $\chi 2$ value of 95.8 with a p-value < 0.05. Therefore, this result concluded that endogeneity existed in the model. Consequently, GMM was chosen as the best model. Due to the inherent endogeneity and simultaneity, previous studies used the dynamic panel model (Bolarinwa, Obembe, & Olaniyi, 2019; Bolarinwa, Olayeni, & Vo, 2021; Dietrich & Wanzenried, 2014; Yanikkaya, Gumus, & Pabuccu, 2018).

The GMM model results showed that bank performance had a significantly positive effect on sustainable growth (β=0.070, p<0.01), and H1 was accepted. The higher bank performance will contribute to higher sustainable growth. This result was understandable and consistent with Altahtamouni et al. (2022) and Zheng and Escalante (2020).

Liquidity proxied by the loan-to-deposit ratio (LDR) had a negative coefficient on sustainable growth and was significant (β=0.088, p<0.05), hence, H2 was accepted. This correlated with the results of Junaidi et al. (2019); Kessy et al. (2021) and Pratama (2019). The negative effect of liquidity on sustainable growth could be seen in the following reasons: Banks certainly need to maintain liquidity to meet their short-term payouts (Yahaya, Mahat, Yahya, & Matemilola, 2022). Banks must pay liquidity-related costs such as reserve requirements and short-term liquidity measures (Huong, Nga, & Oanh, 2021). Moreover, banks that need liquidity must pay a higher premium. Lastly, Basel III liquidity requirements dictate higher liquidity costs (Yahaya et al., 2022). The higher LDR means the bank has a higher opportunity cost for more profitable bank activities (Moussa & Boubaker, 2020). This was contrary to Golubeva et al. (2019) who pointed out a non-conclusive result on the effect of liquidity on performance, generating a non-conclusive result of liquidity on sustainable growth. Meanwhile, Bordeleau and Graham (2010) and Chen et al. (2018) suggested that the non-conclusive result showed liquidity was an endogenous variable.

Lending growth had a positive coefficient on sustainable growth and was significant (β=0.056, p<0.05). This result supported the hypothesis and was in line with other research in Indonesia that lending growth directly and indirectly positively affected banking performance with loan quality as a mediator (Wijayanti & Mardiana, 2020). However, high lending growth resulting in low banking performance and low sustainable growth might happen due to either bad loan quality or losses from non-lending activities such as market risk or operational risk.

The lending growth, which was sharply reduced in COVID-19, has started to increase in 2021 and 2022, in line with an increased GDP growth from – 2.065% in 2020 to 3.691% in 2021 and 5.31% in 2022. In 2020, we noticed that the lending growth decreased with increased loan loss provision expense due to a GDP downturn caused by COVID-19. In the same year, the government reduced the interest rates from 5% in 2019 to 3.75% in 2020, reduced further to 3.5% in 2021, and only increased it again to 5.5% in 2022, as shown in the interest rate graph. The increase rate in 2022 is initiated by Indonesian government to prevent the possibility of capital outflow due to increased USD interest rates set by the Fed.

Following COVID-19, OJK issued a new policy that allowed a relaxation for credit quality assessment, restructuring policy, and loan loss provision since March 2020 (Financial Services Authority of the Republic of Indonesia, 2020) was extended for small and medium enterprises and labor-intensive industries (Financial Services Authority of the Republic of Indonesia, 2020) and ended only in 2024 (Financial Services Authority of the Republic of Indonesia, 2024).

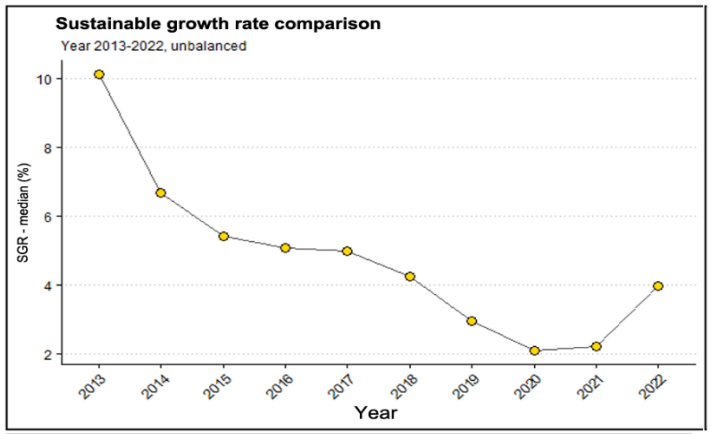
Prior to COVID-19, credit quality (loan quality) is assessed based on 3 pillars, namely business prospects, debtor performance, and ability to pay, which are called the three pillars of asset quality assessment (Financial Services Authority of the Republic of Indonesia, 2019). This was supported by Munoz (2021) study that regulatory relaxation on LLPs would increase banks' lending, emphasizing the implications of regulatory changes in lending growth within the banking sector. OJK relaxation requires only 1 pillar assessment, which is timely payment, which reflects the ability to pay by the customers.

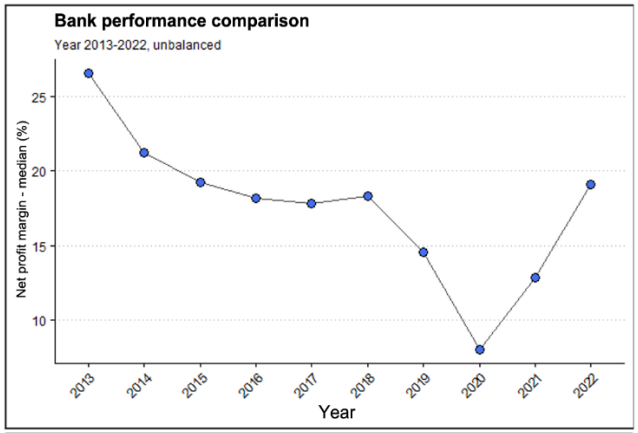
Interestingly, the research results contradict those of other studies on loan quality. The loan quality represented by loss loan provision expense had a negative, insignificant effect on sustainable growth (β=-0.089, p>0.05). Therefore, H4 was rejected. There were two main reasons for the insignificant negative effect of lending quality on

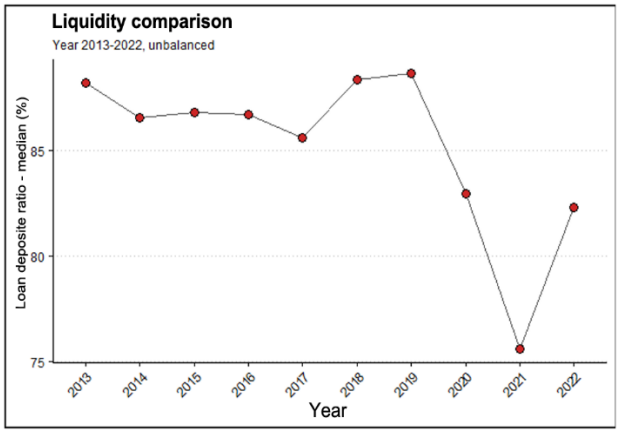
sustainable growth, such as COVID-19 provision relaxation that existed from 2020 to 2024 and may also have been attributed to income smoothing practices. Basel III did not hinder income smoothing practices through LLPs management (Chen et al., 2021; Pramono, Rossieta, & Soedarmono, 2019). Studies from 26 EU countries revealed that LLPs were used for income smoothing even after IFRS adoption and Basel rules (Vasilakopoulos, Tzovas, & Ballas, 2019). Despite the implementation of IFRS 9, which uses an expected loss methodology instead of incurred loss, banks continued to use LLPs for income smoothing (Bojar, 2023). Banks might have used LLPs to smoothen their earnings management (Ahmed, Takeda, & Thomas, 1999; Kanagaretnam, Lobo, & Yang, 2004).

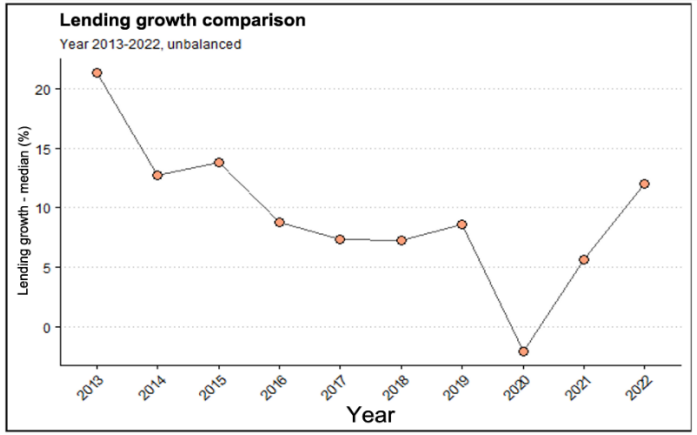
From 2013 to 2022, as seen in Figure 1, lending growth has a similar shape to GDP growth. GDP growth facilitated an improvement in loan quality (Rachuba, 2020). The COVID-19 pandemic led to a decline in GDP (Altig et al., 2020), which had a significant impact on Indonesia (Hasan, 2020). The government's social restriction policy in Indonesia incapacitated the economy (Herwany, Febrian, Anwar, & Gunardi, 2021) and the banking industry (Goodell, 2020). There was a negative relationship between GDP and loan quality. Heightened policy uncertainty attracted higher LLPs (Ozili, 2019). Interest rates had a significant negative relationship with lending growth. Companies tended to borrow less when interest rates were high and more with low interest rates. Higher interest rates deterred lending growth (Olokoyo, Ibhagui, & Babajide, 2020). After two quarters of monetary policy tightening, an empirical study in Indonesia found that lending growth was slowed down due to fewer loans that had not yet been paid off and less market funding liquidity (Soedarmono, Gunadi, Pambudi, & Nurhayati, 2021). However, this study proved otherwise: both GDP and interest rates were insignificant to the sustainable growth of banks.

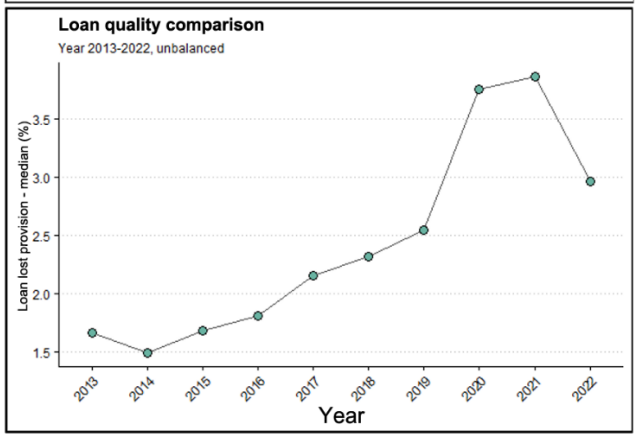
Inefficiency had a negative effect on sustainable growth (β=-0.248, $p<0.01$), therefore H5 was accepted. The negative effect of inefficiency on sustainable growth was corroborated by Isnurhadi et al. (2022) and Junaidi et al. (2019). Capital had a positive effect on sustainable growth (β=0. 047, $p<0.10$), indicating that H6 was accepted but with a 0.10 significance level. The results aligned with the findings of Louri and Migiakis (2019) and Nor et al. (2017) demonstrating a positive impact of capital on sustainable growth. A continued increase in capital ratio was observed despite the COVID-19 pandemic (2020-2022). This was not surprising due to the capital buildup because of higher profit with fewer provision expenses, leading to a higher CAR.

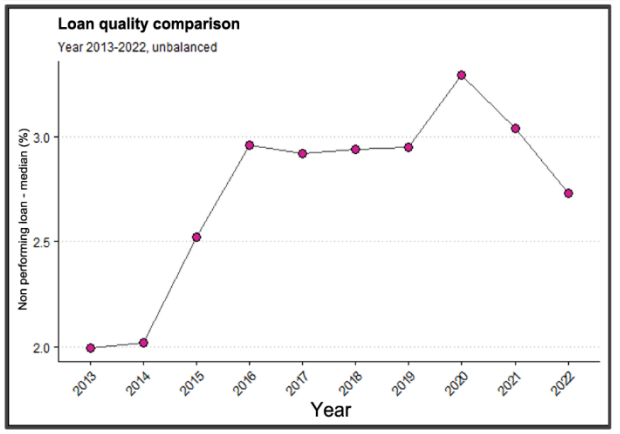












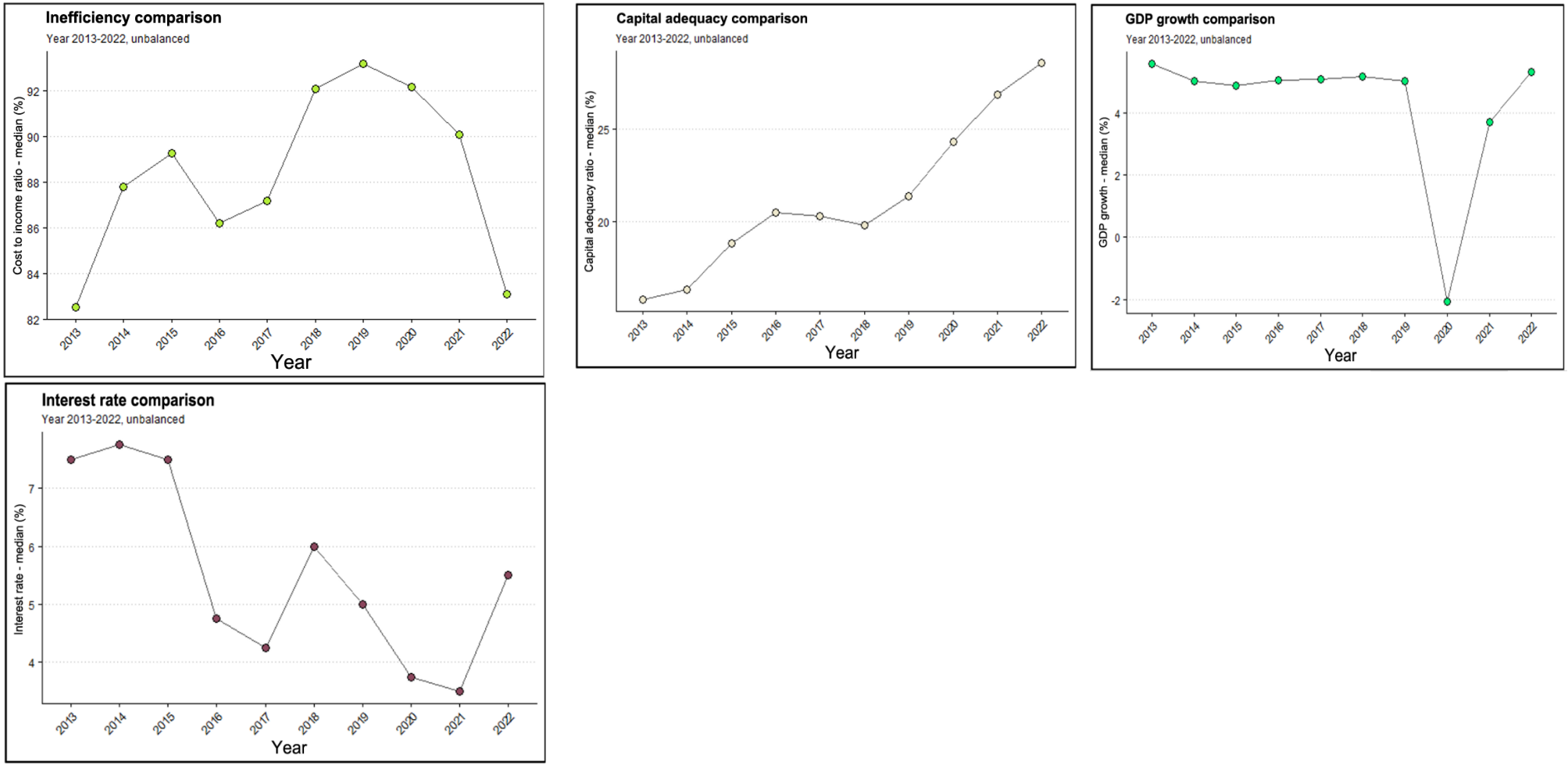


Figure 1. Yearly distribution of variables (2013-2022).

4.4. Robustness Test for GMM Model

This section presents the robustness test results, obtained using the GMM estimator and substituting the loan loss provision expense (LLP expense) with non-performing loan (NPL). The robustness test is shown in Table 5.

Table 5. Results of robustness test (Asset quality).

Variable	FDGMM-LLP	FDGMM-NPL
Independent variable:		
Lagged sustainable growth	0.089*	0.085*
Bank performance (NPM)	0.070***	0.058**
Liquidity (LIQ)	-0.088**	-0.074***
Lending growth (LGROW)	0.056**	0.048***
Inefficiency (INEF)	-0.248***	-0.262***
Capital (CAP)	0.107*	0.118*
Loan quality (LQ)	-0.089	-0.816***
Control variable:		
Banks size (SIZE)	-7.182***	-7.434***
GDP growth (GDPG)	0.002	-0.008
Interest rate (IR)	-0.221	-0.226
Observations	352	352
Pseudo R2	-	-
Wald p-value	0.000	0.000
Sargan p-value	0.171	0.270
AR(1) p-value	0.097	0.152
AR(2) p-value	0.658	0.661

Note: *p<0.1; **p<0.05; ***p<0.01.

The results of the GMM estimation with NPL as a proxy for loan quality were consistent with those reported using LLPs for all variables, except for loan quality. The significant negative result on loan quality represented by NPL was concluded by Isnurhadi et al. (2022); Junaidi et al. (2019) and Pratama (2019). However, this result was contrary to Abbas and Ali (2022) that deteriorating loan quality, represented in both LLPs and non-performing loans, are consequences of high lending growth.

Loan quality with NPL as a proxy showed a negative and significant effect on sustainable growth. NPL reached its peak in December 2020 due to COVID-19 and started to decrease in 2021 and 2022 with the recovery in the economy as shown in GDP. COVID-19 caused a significant increase in loan loss provision expense in 2020, resulting in a 2.1% decrease in GDP growth. The increase in loan loss provision continued in 2021, with previously restructured debtors unable to perform, resulting in additional loan loss provision, while provision expenses have begun to decline in 2022.

The effects of lagged sustainable growth, performance, liquidity, lending growth, capital, and inefficiency on sustainable growth were consistent and similar. The majority of variable coefficients experienced a slight decrease, with the exception of inefficiency and capital, which demonstrated a slight increase. The findings showed that the relationship between independent variables and sustainable growth was robust.

5. CONCLUSIONS AND RECOMMENDATIONS

This study addressed sustainable growth, a vital factor for the long-term viability of banks, focusing on Indonesia's rapidly growing economies. By enhancing the Higgins model specifically for banks, the study contributed to the literature on sustainable growth models, providing a tailored method for the banking sector. This partially confirmed the findings of previous studies on sustainable growth, which showed a significant negative impact of inefficiency on sustainable growth.

The novelty of this research is to confirm the determinants of sustainable growth for commercial banks in Indonesia encompassing periods prior to, during, and after pandemic COVID-19. Previous studies have not yet investigated the impact of lending growth on sustainable growth. Our research results show that both lending growth and capital are vital and significantly affect sustainable growth. Also, that lagged sustainable growth positively affects the current sustainable growth, which was previously rarely studied. It is also evident that liquidity and inefficiency have a significant negative effect on sustainable growth, while contrary to other previous research, the research result shows an unexpected result with the loan quality proxied by LLPs expense having a negative effect on sustainable growth, which is proved to be insignificant. This may be due to government policy imposed in 2020 until 2024 to lessen the COVID-19 impact.

The study results help commercial banks understand the determinants that affect sustainable growth. Without considering lending growth as one of the main drivers for financial intermediation, the research on sustainable growth has overlooked a crucial factor that contributes to sustainability. In this context, the study shed light on how lending growth positively affects sustainable growth, while the insignificance of loan quality might be attributed to COVID-19 provision relaxation by the Indonesia Financial Services Authority from 2020 to March 2024 and income smoothing practices by banks. During unexpected events such as COVID-19 pandemic during the research period (2013-2022), it has been demonstrated that regulator involvement played an important role for sustainable growth in commercial banks in Indonesia, with relaxation from 2020 to 2024 to lessen the COVID-19 impact.

It was recommended that regulators focus on ensuring the adequacy of LLP expenses in commercial banks, noting that provision expenses have not been as ample as prior to COVID-19 period. It is suggested that financial services authorities strengthen supervision on the loan quality books of commercial banks in Indonesia following the uplifting of relaxation policy.

The limitation of this study is that the study has not taken into consideration the interdependency analysis among bank-specific characteristics for a deeper understanding of how these factors interact to drive sustainable growth. Future research in other countries can replicate the study to enhance the generalizability of the findings.

The findings provided valuable insights for both academics and practitioners on the determinants of sustainable growth, including the importance of effective management of lending growth and the impact of government policy. Future research to evaluate lending growth and/or capital as a moderating variable on each determinant of sustainable growth is advisable. It is also suggested to conduct longitudinal studies across various economic cycles to include the prior 2008 financial crisis period to assess the robustness of the findings in different economic conditions. External events such as the COVID-19 challenged the relationship, and this could be for future research. Policy changes are happening, and how banks adapt to different policy changes is interesting for future research.

The loans-to-GDP ratio in Indonesia is quite low compared to other ASEAN countries. Sustainable growth drivers may differ, and future research that investigates further factors is crucial to enhancing the sustainable growth of banks in ASEAN countries. Different regulatory relaxation schemes by different regulators, and the study would be useful for any possible idiosyncratic events that may happen in the future. Future research on how government policies can be designed to accelerate the impact on sustainable growth, in this case to contribute to higher lending growth and to undermine the negative impact of such policy.

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