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Is Profitability the Missing Link? Green Financing, Capital Adequacy, Credit Risk, and Efficiency in Driving Firm Value

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Abstract: This study provides empirical evidence on whether profitability remains a key link in the influence of emerging factors, such as green financing, and traditional factors on firm value. The study uses panel data from six conventional commercial banks included in the LQ45 index during the 2019–2023 observation period. The results indicate that neither Green Financing nor capital adequacy directly impacts profitability or firm value. However, credit risk and efficiency exhibit significant negative effects on both outcome variables, while profitability itself significantly positively impacts firm value. Other findings indicate that profitability is only a key link in the influence of operational efficiency on firm value but does not serve as a significant pathway for Green Financing, capital adequacy, and credit risk. Overall, this study underscores that operational discipline (cost efficiency) has a greater impact on market value than sustainable financing initiatives and capital adequacy.

Keyword: Green Financing, Firm Value, Credit Risk, Capital Adequacy, Profitability, Efficiency.

INTRODUCTION

As sustainability becomes a priority within global industries, financial institutions have increasingly integrated environmental responsibility into their primary lending strategies. In the Indonesian banking sector, Green Financing, which is often measured by the Green Research Initiative (GRI) index, has developed into a vital tool for risk mitigation and a significant reputational asset. These factors potentially influence firm value, which represents the market's perception of a company's overall health and future prospects as reflected in the Price-to-Book Value (PBV) ratio (Abuatwan, 2023; Ozili, 2022). Stakeholder theory provides a framework for this relationship. Furthermore, based on signaling theory, environmental commitments signal to regulators, customers, and ESG-focused institutional investors, banks can broaden their shareholder base and stimulate stock demand, which eventually strengthens market capitalization. Furthermore, the expansion of sustainable financing is expected to diversify revenue streams and reach new borrower segments, supporting higher profitability as measured by Return on Assets (ROA).

In addition to sustainability, traditional determinants of bank performance remain essential to investor evaluations, as also explained by signaling theory. The Capital Adequacy Ratio (CAR) is a cornerstone of prudential banking regulation because it represents a bank's ability to absorb unexpected losses and maintain its role in financial intermediation (Hulu & Siswanti, 2023). According to signaling theory, a robust capital position communicates financial stability and disciplined management. This reduces perceived investment risk, lowers the cost of capital, and can lead to higher valuation multiples. Moreover, a solid capital base provides banks with the necessary flexibility to expand lending, capturing more net interest income and boosting overall profitability without relying on excessive leverage.

Credit risk and operational efficiency are two internal factors that directly impact bank performance. The Non-Performing Loan (NPL) ratio measures the extent of borrower defaults. An increase in NPLs requires banks to set aside higher loss provisions, which reduces net income and lowers ROA. Markets also interpret a weak loan portfolio as a signal of poor underwriting standards, an impression that often damages investor confidence and pulls the PBV downward. Similarly, operational efficiency, expressed through the ratio of Operating Expenses to Operating Income (BOPO), reflects how well management controls costs. Efficiency in these internal factors is closely linked to the broader capital structure and growth objectives of the firm (Alwan & Risman, 2023). A high BOPO suggests that overhead costs consume a large portion of revenue, thereby narrowing profit margins. Conversely, lower BOPO ratios indicate efficiency that allows for reinvestment or dividend distribution, supporting both profitability and stock valuations.

The discourse on how green financing influences bank valuation remains fragmented in global literature. While some empirical evidence suggests that green initiatives can enhance firm value by mitigating long-term environmental risks and strengthening corporate reputation (Cui et al., 2018; Zhang et al., 2021), other studies reveal that the financial benefits of such initiatives may take considerable time to materialize. For instance, research on emerging-market contexts indicates that the high initial costs, regulatory uncertainty, and limited investor awareness surrounding green finance often led to weak or inconsistent market valuation effects (Liang & Renneboog, 2017; Ferrell et al., 2016). Moreover, the intensity of regulatory pressure combined with uneven disclosure quality has caused investors to prioritize short-term profitability over long-term sustainability in developing economies (Serafeim, 2020). These competing dynamics highlight the need to understand how internal financial mechanisms, particularly profitability, mediate the link between sustainability investment and firm value.

Beyond external sustainability efforts, internal fundamentals such as operational efficiency and credit risk management remain central determinants of banking performance. Evidence from European and global banking markets shows that cost efficiency is a key predictor of profitability, where mismanagement of operating expenses directly compresses margins and reduces shareholder value (Tan & Floros, 2012; Berger & Humphrey, 1997). Similarly, high levels of non-performing loans significantly undermine both earnings and investor confidence, exerting downward pressure on firm value (Sufian & Chong, 2008; Ali Mirzaei et al., 2013). However, many empirical models treat these operational variables in isolation, disregarding the interplay between financial efficiency, risk exposure, and sustainability orientation. This study fills that gap by integrating internal and external determinants into a unified mediation framework, positioning profitability as the missing link that translates operational and sustainability drivers into measurable market value.

Profitability acts as the central link between these variables, serving as the primary indicator of how effectively management generates earnings from assets. A consistent record of high ROA signals strong future cash flows, which drives investor interest and leads to premium market valuations. This study views financial performance as a vital mediating

variable, connecting the influence of sustainability and operational factors to the overall value of the firm (Pamungkas & Risman, 2025). The influence of Green Financing, capital adequacy, credit risk, and efficiency on firm value is expected to manifest through their impact on profitability before being fully incorporated into the PBV ratio. Within this context, the current research aims to address an empirical gap by analyzing these relationships in the Indonesian banking industry to provide practical insights for both corporate leadership and policymakers.

METHOD

This study employs a quantitative causal approach using a path analysis model. The data used are secondary data from the financial statements of conventional commercial banks listed in the LQ45 index during the 2019–2023 period. Therefore, the study population consists of only six conventional commercial banks included in the LQ45 index, and we used all of these banks as a sample (saturated sample).

The data analysis method is carried out through several steps: selecting a panel data model using three tests (Chow, Haussman, and Lagrange Multiplier), Model Feasibility Testing, and Hypothesis Testing (direct and indirect effects).

The conceptual framework is as follows:

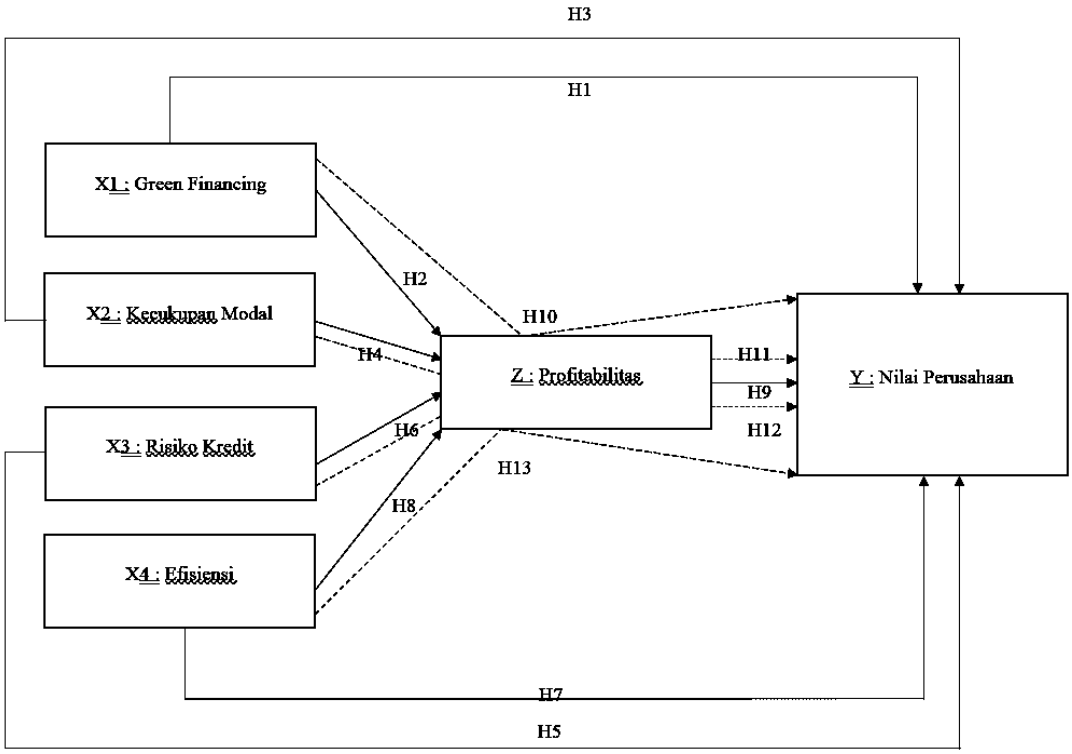

Figure 1. Conceptual Framework

RESULT AND DISCUSSION

Results

Based on the results of the model selection test (Chow, Haussman), we use the Fixed Effects Model in the first and second regression equations, so that the regression results are as follows:

Tabel 1. Direct Effect Test Results First Equation

Variable	Coefficient	Prob
C	20.38501	0.0583
GF	2.117877	0.4315
CAR	9.147592	0.1377
NPL	-537.4237	0.0069
BOPO	-22.00284	0.0245
ROA	4.521633	
R-Squared	0.670579	
Adjusted R-Squared	0.497199	

Tabel 2. Direct Effect Test Results Second Equation

Variable	Coefficient	Prob
C	-0.634376	0.6193
GF	0.389242	0.2350
CAR	0.256472	0.7312
NPL	-48.14365	0.0220
BOPO	-4.069340	0.0000
R-Squared	0.808752	
Adjusted R-Squared	0.722690	
Prob(F-Statistic)	0.000018	

We used the Sobel Test to test the indirect effect hypothesis, resulting in the following results:

Tabel 3. Indirect Effect Test Results (Sobel Test)

Variable	t-Statistic	P-Value	Conclusion
GF-ROA-PBV	1.102152	0.270396	not mediated
CAR-ROA-PBV	0.345173	0.729964	not mediated
NPL-ROA-PBV	-1.771901	0.076411	not mediated
BOPO-ROA-PBV	-2.337874	0.019393	mediated

Discussion

Green Financing does not show a statistically significant effect on firm value, with a probability value of 0.4315 that exceeds the 0.05 threshold. This result indicates that green lending activities have not yet been factored into how investors assess bank valuation. One reason for this is the limited transparency in reporting green financing portfolios, which makes it difficult for investors to evaluate the actual scale and quality of a bank's environmental commitment. In theory, allocating funds to environmentally responsible projects should improve a bank's reputation and strengthen its long-term business prospects, yet this effect is only likely to appear when programs are implemented consistently and supported by clear, measurable environmental targets. Green Financing likewise produces no significant effect on profitability. This outcome reflects the reality that green initiatives in Indonesian banking are still in early stages of adoption, where upfront costs tend to be relatively high while financial returns take several years to materialize, leaving near-term earnings largely unaffected.

The Capital Adequacy Ratio does not produce a significant effect on either firm value or profitability, with probability values of 0.1377 and 0.7312 respectively. Although CAR is widely used as an indicator of a bank's capacity to absorb unexpected losses and maintain operational stability, a high ratio alone does not guarantee improved financial returns. Capital becomes productive only when it is deployed efficiently into lending and investment activities that generate adequate yields. A bank that maintains capital well above the regulatory minimum without directing those resources toward profitable uses will not see a positive effect on either earnings or market valuation. Investors appear to recognize this distinction, valuing capital adequacy primarily as a risk management tool rather than as a direct driver of growth. Accordingly, the strategic priority should not be raising the CAR level further but ensuring that existing capital is allocated to activities that contribute meaningfully to profitability and competitive positioning.

Credit risk produces a significant negative effect on both profitability and firm value, with probability values of 0.0220 and 0.0069 respectively. When the Non-Performing Loan ratio rises, two consequences follow in parallel. First, banks are required to set aside larger provisions for loan losses, which directly reduces net income and lowers the Return on Assets. Second, investors interpret a growing NPL ratio as a signal that the quality of the loan portfolio is weakening, which increases perceived risk and reduces the Price-to-Book Value. This pattern confirms that credit quality sits at the center of banking performance: a deteriorating loan book erodes earnings from within while simultaneously undermining investor confidence from without. Managing this risk through careful borrower selection, ongoing loan monitoring, and timely restructuring of problem accounts is therefore essential to preserving both financial performance and market valuation over time.

Operational efficiency shows a significant negative effect on both profitability and firm value, with probability values of 0.0000 and 0.0245. A higher BOPO ratio indicates that a bank is spending a greater proportion of its income on operating costs, which narrows profit margins and reduces the net income available to shareholders. From the market's perspective, a persistently elevated BOPO ratio is a sign that management has not been effective in controlling costs relative to the income it generates, which weakens investor confidence and puts downward pressure on share valuation. Conversely, banks that achieve a lower BOPO through disciplined cost management, investment in digital infrastructure, and optimization of business processes can generate wider margins and deliver stronger returns. Efficiency is therefore not simply an internal performance metric but a visible signal to the market of a bank's competitive capacity and management quality.

Profitability shows a positive and significant effect on firm value, with a coefficient of 4.5216 and a probability value of 0.0205. A bank that generates a high Return on Assets demonstrates to the market that it can convert its asset base into earnings reliably and efficiently. Investors use this track record as a basis for estimating future cash flow: consistent profitability reduces uncertainty about a bank's ability to sustain dividends and retained earnings, which in turn supports a higher Price-to-Book Value. This finding is aligned with signaling theory, which holds that superior reported earnings function as a credible signal of management quality and business durability. For Indonesian LQ45 banks, maintaining above-average profitability is therefore not only a financial objective but also a market communication instrument that shapes how investors price the stock.

The Sobel test for the indirect path from Green Financing through profitability to firm value yields a t-statistic of 1.1022 and a probability value of 0.2704, indicating that ROA does not mediate this relationship. This result follows directly from the finding that Green Financing has no significant effect on ROA: when the first step in the causal chain is absent, no indirect pathway can be transmitted. For an indirect effect to operate, both the link from GF to ROA and the link from ROA to PBV must be statistically meaningful; here, only the

second is confirmed. The implication is that the benefits of green financing will not reach firm value through a profitability channel until banks can demonstrate that their green portfolios generate measurably better earnings outcomes, whether through lower default rates, new fee income streams, or access to lower-cost ESG-linked funding. Achieving this requires banks to move beyond green financing as a compliance exercise and integrate it as a genuine driver of operational and financial performance.

The Sobel test for the Capital Adequacy-ROA-PBV pathway returns a t-statistic of 0.3452 and a probability value of 0.7300, confirming that profitability does not mediate the effect of CAR on firm value. Because capital adequacy does not significantly affect ROA in the first equation, the prerequisite for mediation is not met, and any influence that CAR might have on market valuation must operate through channels other than profitability, such as regulatory perception or systemic risk assessment. This finding reinforces the view that maintaining an adequate capital ratio serves primarily a protective function rather than a value-creating one. For the CAR-profitability-firm value chain to become active, bank management would need to demonstrate that higher capitalization is matched by higher-quality asset deployment, producing a visible improvement in ROA that the market can observe and price. Absent that link, a high CAR remains a necessary condition for regulatory compliance but not a sufficient one for enhancing firm value.

Although NPL has a direct and significant negative effect on both ROA and PBV, the Sobel test indicates that the indirect path from NPL through ROA to PBV does not reach significance, with a t-statistic of -1.7719 and a probability value of 0.0764. This suggests that the market's reaction to credit risk is largely immediate and direct, rather than being delayed until the earnings impact appears in financial statements. Investors are likely adjust their valuation of a bank as soon as NPL data become observable in periodic reports, ahead of the full provisioning effect on ROA. Banks may also partially offset the earnings drag from rising NPLs through non-interest income or cost containment, reducing the strength of the NPL-to-ROA pathway and weakening the mediation channel. Regardless, the direct effect of credit risk on firm value remains clear and significant, reinforcing the importance of maintaining sound underwriting practices and proactive portfolio management to protect both financial performance and investor confidence.

Efficiency is the only variable for which the mediation pathway through profitability is statistically confirmed, with a Sobel t-statistic of -2.3379 and a probability value of 0.0194. This result means that part of the effect of BOPO on firm value operates through its impact on ROA: when a bank reduces its cost-to-income ratio, profitability improves, and that improvement is subsequently recognized by the market in the form of a higher Price-to-Book Value. The confirmed mediation chain from operational efficiency to profitability to firm value carries an important practical message. Management cannot expect cost reduction to translate directly into stock price gains; the efficiency improvement must first be sustained long enough to produce a visible and consistent shift in reported earnings. Once that profitability record is established, the market treats it as evidence of durable competitive strength, leading to higher valuation multiples. This sequence underscores that efficiency programs are most effective as value-creation tools when they are sustained, measurable, and communicated transparently to investors.

CONCLUSION

The results of this study show that the firm value and profitability of conventional commercial banks in the LQ45 index are shaped primarily by credit risk and operational efficiency. Both the Non-Performing Loan ratio and the BOPO ratio produce significant negative effects on Return on Assets and Price-to-Book Value, while Return on Assets itself has a significant positive effect on firm value. Among all tested variables, operational

efficiency is the only one whose indirect effect on firm value through profitability is statistically confirmed by the Sobel test, identifying it as the key transmission channel from operational performance to market valuation.

Green Financing and the Capital Adequacy Ratio do not produce significant effects on profitability or firm value during the observation period. This does not mean these variables are without strategic value, but rather that their financial impact has not yet materialized within the 2019-2023 window examined here. Green financing in Indonesian banking is still in an early adoption phase where costs precede returns, and capital ratios across all sample banks already exceed regulatory minimums by a comfortable margin, limiting the informational value of further increases. In both cases, the contribution to profitability and firm value will depend on how effectively these instruments are embedded into productive business activities rather than treated as compliance requirements.

For banking management, these findings suggest a clear ordering of priorities. In the near term, controlling non-performing loans and reducing operating costs should be treated as the most direct levers for improving both profitability and market valuation. The confirmed mediation of efficiency through ROA indicates that cost discipline needs to be sustained over time before its full effect on firm value becomes visible to investors. For green financing and capital management, the appropriate strategy is to develop longer-term plans that connect these instruments to measurable earnings improvements, so that their contributions can be observed and valued by the market as the Indonesian sustainable finance ecosystem continues to develop.

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