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The Impact of Debt Equity Ratio and Return on Assets on Net Profit Margin

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ABSTRACT

This study examines the association of Debt Equity Ratio (DER) and Return on Assets (ROA) with Net Profit Margin (NPM) at PT. Bank KB Bukopin Tbk. during 2016–2021 in response to reviewer concerns about measurement choice, undeclared scaling, and small-sample inference. Using audited annual reports, the article is repositioned as an exploratory single-case study with six firm-year observations. All ratios are reported in their original percentage values; no transformation or standardization was applied. In the banking context, NPM is retained only as a supplementary bottom-line margin proxy and is defined here as net income after tax divided by total revenue reported in the annual reports. Shapiro-Wilk diagnostics and OLS estimates are reported cautiously because the sample is very small. Recalculated results show that DER has a positive but statistically insignificant association with NPM, whereas ROA has a strong positive association. In the joint model, ROA remains statistically significant while DER does not. The findings are specific to KB Bukopin and should not be generalized beyond this case.

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1. INTRODUCTION

In an era of accelerating globalization, capital markets occupy a strategically indispensable position within national economic architecture, functioning simultaneously as mechanisms for corporate capital mobilization and as barometers of systemic financial health. Indonesian capital market development is formally anchored in Law No. 8 of 1995 on Capital Markets, which provides the legal framework governing capital-market activities in Indonesia (Otoritas Jasa Keuangan [OJK], n.d.). Under this regulatory framework, publicly listed companies are mandated to submit annual financial disclosures to the Indonesia Stock Exchange (IDX), establishing a compulsory transparency architecture through which investors, creditors, and regulators continuously assess corporate viability. This obligation is particularly consequential for banking institutions whose balance sheet vulnerabilities propagate rapidly across the broader economy, as evidenced by the severe financial disruption inflicted by the COVID-19 pandemic from 2020 onward.

Against this backdrop, profitability measurement remains analytically important. In banking studies, profitability is more commonly assessed using ROA, ROE, NIM, and efficiency indicators such as BOPO. In this article, Net Profit Margin (NPM) is retained only as a supplementary bottom-line margin proxy, defined as net income after tax divided by total

revenue reported in the audited annual reports. This clarification is necessary because 'sales' is not a standard banking denominator. For PT. KB Bukopin Tbk., the resulting NPM values for 2016–2021 still show sharp margin pressure and therefore remain useful for describing this specific case, but they should not be treated as a primary supervisory profitability ratio.

Table 1. Recapitulation of DER, ROA, and NPM PT. KB Bukopin Tbk. 2016–2021

Indicator	2016	2017	2018	2019	2020	2021
DER	1,008%	1,480%	1,015%	1,028%	846%	576%
ROA	1.0%	0.1%	0.2%	0.2%	-4.1%	-2.6%
NPM	11.6%	1.4%	2.4%	2.8%	-61.4%	-54.6%

Source: PT. KB Bukopin Tbk. Annual Financial Reports 2016–2021

Two financial ratios are theoretically central to explaining this NPM variation: Debt Equity Ratio (DER) and Return on Assets (ROA). DER, commonly measured as total liabilities relative to shareholders' equity, indicates the extent to which the firm's asset base is financed by creditors rather than owners (Amelia & Gulo, 2021). In non-financial settings, persistently high leverage can compress profit margins because a larger financing burden reduces residual earnings (Salim & Yadav, 2012). At PT. KB Bukopin Tbk., DER reached a peak of 1,480% in 2017 before declining progressively to 576% by 2021, coinciding with the ownership restructuring led by KB Kookmin Bank. Critically, in banking contexts, leverage must be interpreted cautiously because liability growth is also closely related to deposit mobilization and intermediation capacity (Berger, 1995; Gnawali & Niroula, 2024).

In parallel, ROA captures the efficiency with which management translates its asset base into earnings and is widely treated as a core internal determinant of bank profitability (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2011). PT. KB Bukopin Tbk.'s ROA deteriorated sharply from 1.03% in 2016 to −4.07% in 2020 and −2.56% in 2021, consistent with the broader bank-profitability literature that treats asset returns as a leading indicator of profitability sustainability (Athanasoglou et al., 2008; Soesetio et al., 2022).

Despite well-established theoretical linkages among DER, ROA, and NPM, the empirical literature yields persistently mixed findings. Some studies report a negative leverage-profitability relationship consistent with capital-structure pressure on earnings (Salim & Yadav, 2012; Ayalew & McMillan, 2021), whereas banking studies often find context-dependent or mixed effects because profitability is jointly shaped by internal bank characteristics, risk exposure, and funding structure (Athanasoglou et al., 2008; Ali & Puah, 2019; Le & Ngo, 2020). The joint conditional effect of DER and ROA on NPM, estimated within a longitudinal single-bank framework spanning a regulatory transition, ownership change, and pandemic shock, remains empirically underexplored in the Indonesian banking literature. The 2016–2021 window at PT. KB Bukopin Tbk. therefore, constitutes an analytically rich setting through which to examine how leverage structure and asset efficiency simultaneously determine bank margin performance under compounded institutional and macroeconomic pressures.

This study offers a more modest contribution as a contextual single-bank case. First, it documents the profitability trajectory of PT. KB Bukopin Tbk. across ownership transition and pandemic stress. Second, it clarifies the raw-data operationalization of DER, ROA, and NPM directly from audited annual reports, with no transformation or standardization. Third, it reports exploratory regression results only as illustrative statistical patterns because six annual observations do not support strong confirmatory inference or broad policy claims.

Accordingly, this study addresses three research objectives in an exploratory sense: (1) to examine the partial association of DER with NPM at PT. KB Bukopin Tbk. during 2016–2021; (2) to examine the partial association of ROA with NPM over the same period; and (3) to assess the joint association of DER and ROA with NPM. The remainder of this article is organized as follows: Section 2 reviews theoretical foundations and develops research hypotheses; Section 3 details methodology; Section 4 presents empirical results; Section 5 discusses findings; and Section 6 concludes.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

2.1 Theoretical Foundations

This study is grounded in the bank-profitability literature, which views profitability as the joint outcome of capital structure, asset utilization efficiency, and other bank-specific internal determinants (Athanasoglou et al., 2008; Menicucci & Paolucci, 2016; Le & Ngo, 2020). Financial ratios serve as operational proxies through which these managerial and structural effects are systematically evaluated. Leverage ratios such as DER capture funding structure and associated risk-return trade-offs, while asset-efficiency ratios such as ROA reflect the productive use of total assets. Both dimensions converge on NPM as the profitability outcome that summarizes the ability to transform revenue into residual earnings.

2.2 Debt Equity Ratio and Net Profit Margin

Debt Equity Ratio is defined as the proportion of total liabilities relative to total shareholders' equity, functioning as a direct indicator of the degree to which a firm's asset base is financed through external debt rather than internal equity (Amelia & Gulo, 2021). The theoretical mechanism linking DER to NPM operates primarily through the financing-burden channel: as leverage rises, interest or funding costs can compress net earnings and consequently net profit margin (Salim & Yadav, 2012). In this sense, the expected relationship between leverage and profitability is commonly negative when debt exceeds its efficient level (Ayalew & McMillan, 2021).

However, the banking context necessitates a critical interpretive qualification. In commercial banking, a high leverage position often reflects the scale of deposit-based intermediation rather than reckless debt accumulation alone, so liability growth can coexist with stronger income-generation capacity (Berger, 1995; Gnawali & Niroula, 2024). Based on this reasoning, the following hypothesis is proposed:

> **H_1:** Debt Equity Ratio has a significant effect on Net Profit Margin

2.3 Return on Assets and Net Profit Margin

Return on Assets is a profitability indicator that reflects how efficiently management converts total assets into earnings and is widely used as a core internal determinant of bank performance (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2011). The theoretical linkage to NPM is direct and mechanistic: improvements in asset utilization, revenue generation, and cost control tend to flow through to stronger net margins. Evidence from Indonesian banking research also shows that internal bank characteristics significantly shape profitability outcomes (Soesetio et al., 2022). Based on this logic and empirical alignment:

> **H_2:** Return on Assets has a significant effect on Net Profit Margin

2.4 Joint Effect of DER and ROA on NPM

While H_1 and H_2 isolate the partial effects of DER and ROA respectively, the theoretical case for their simultaneous inclusion in a profitability model rests on complementary explanatory domains: DER captures capital structure risk and the financing cost burden, while ROA captures operational and asset-deployment efficiency. Together, they span two important channels through which profitability is formed in banking: funding structure and asset-efficiency performance. Prior empirical studies show that bank profitability is shaped by multiple internal determinants operating simultaneously rather than in isolation (Menicucci & Paolucci, 2016; Ali & Puah, 2019). In this framework, leverage structure can reinforce or weaken the profitability contribution of asset productivity, making joint estimation theoretically relevant (Ayalew & McMillan, 2021). Accordingly:

> **H_3:** Debt Equity Ratio and Return on Assets simultaneously have a significant effect on Net Profit Margin

2.5 Conceptual Framework

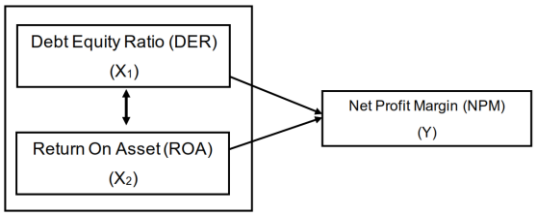

Figure 1. Conceptual Framework

3. METHODOLOGY

3.1 Research Design

This study adopts a quantitative research design with a longitudinal observational approach, examining the directional and magnitude effects of DER and ROA on NPM over a six-year period. Secondary data derived from audited annual financial reports are employed to preserve objectivity, consistency, and regulatory verifiability within a single-firm longitudinal setting.

3.2 Study Setting, Population, and Sample

The study is conducted within the institutional context of PT. KB Bukopin Tbk., a publicly listed commercial bank on the Indonesia Stock Exchange (IDX). The sample is limited to six consecutive fiscal years spanning 2016 through 2021, selected to capture pre-acquisition fragility, ownership transition under KB Kookmin Bank, and early post-rebranding adjustment. Because the unit of analysis is a single bank-year and N = 6, the design is explicitly treated as an exploratory single-case study. Any regression estimates reported below are therefore interpreted as illustrative associations, not as strong causal or generalizable evidence.

3.3 Measurement Instruments

Variable operationalization follows standard financial-ratio formulations, adjusted where necessary to fit the banking context, as detailed in Table 2 below. All ratios are reported in their original percentage form; no log transformation, rescaling, or standardization was applied.

Table 2. Measurement Instruments

Variable	Formula	Source
Net Profit Margin (NPM)	NPM = (Net Income After Tax / Total Revenue) × 100%	Stefanie & Setiawati (2019); denominator aligned to bank total revenue
Debt Equity Ratio (DER)	DER = (Total Liabilities / Total Equity) × 100%	Amelia & Gulo (2021); Salim & Yadav (2012)
Return on Assets (ROA)	ROA = (Net Income Before Tax / Total Assets) × 100%	Athanasoglou et al. (2008); Dietrich & Wanzenried (2011)

Source: adapted from the cited journal articles.

To address the three research hypotheses, the study employs two complementary regression models: simple linear regression for H_1 and H_2 (partial effects), and multiple linear regression for H_3 (simultaneous effect). All models are estimated using IBM SPSS Statistics version 20.0.

Model 1 — Simple Linear Regression (H_1): $\hat{Y} = \beta_0 + \beta_1 X_1 + \varepsilon$ (where X_1 = DER)

Model 2 — Simple Linear Regression (H_2): $\hat{Y} = \beta_0 + \beta_2 X_2 + \varepsilon$ (where X_2 = ROA)

Model 3 — Multiple Linear Regression (H_3): $\hat{Y} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$

3.5 Diagnostic Tests

Prior to hypothesis testing, the study reports a limited set of exploratory diagnostics. Given that N = 6, Shapiro-Wilk is used as a small-sample normality check, while Tolerance/VIF and a Glejser regression are retained only as descriptive specification diagnostics. Exact p-values are reported for the regression models, and any reference to critical t or F values is presented only as a secondary check rather than as the sole basis for inference.

4. RESULTS

4.1 Descriptive Statistics

Table 3 presents descriptive statistics recalculated from the raw percentage values for DER, ROA, and NPM across the six-year observation window (2016–2021) at PT. KB Bukopin Tbk.

Table 3. Descriptive Statistics — DER, ROA, and NPM (SPSS Output)

Statistics	DER	ROA	NPM
N (Valid)	6	6	6
Mean	992.17	-0.84	-16.30
Median	1011.50	0.17	1.90
Std. Deviation	294.82	2.00	32.58
Skewness	0.479	-1.082	-0.930
Kurtosis	1.819	-0.453	-1.746
Minimum	576.00	-4.07	-61.40
Maximum	1480.00	1.03	11.60
Sum	5953.00	-5.05	-97.80
Note	Raw % values	Raw % values	Raw % values

Source: Data processed by researcher, 2022. Note: raw percentage values are reported; no transformation or standardization was applied.

4.2 Raw Data: DER, ROA, and NPM

Table 4. Calculated Values of DER, ROA, and NPM (2016–2021)

Year	DER (%)	ROA (%)	NPM (%)
2016	1,008	1.03	11.6
2017	1,480	0.13	1.4
2018	1,015	0.20	2.4
2019	1,028	0.22	2.8
2020	846	-4.07	-61.4
2021	576	-2.56	-54.6

Source: PT. KB Bukopin Tbk. Annual Financial Reports 2016–2021 (data processed).

4.3 Classical Assumption Diagnostics

4.3.1 Normality Diagnostic (Shapiro-Wilk)

Table 5. Shapiro-Wilk Normality Diagnostic

Test	DER	ROA	NPM
N	6	6	6
Shapiro-Wilk W	0.922	0.825	0.751
Sig. (p)	0.519	0.098	0.020
Decision	Normal	Normal	Non-normal
Reading	Cautious	Cautious	Cautious
Scale	Raw %	Raw %	Raw %
Sample	n = 6	n = 6	n = 6
Source	Calc.	Calc.	Calc.

Source: Data processed by researcher, 2022.

Shapiro-Wilk results should be read cautiously because the sample contains only six observations. DER (p = 0.519) and ROA (p = 0.098) do not reject normality at the 5% level, whereas NPM (p = 0.020) departs from normality. Accordingly, the normality test is treated only as a descriptive diagnostic and the regression results are interpreted as exploratory rather than confirmatory.

4.3.2 Multicollinearity Test (Tolerance & VIF)

Table 6. Multicollinearity Diagnostics

Variable	Tolerance	VIF
DER	0.647	1.545
ROA	0.647	1.545

Dependent Variable: NPM. Source: data processed from PT. KB Bukopin annual reports.

Both predictors returned Tolerance = 0.647 (> 0.10) and VIF = 1.545 (< 5.00), indicating no material multicollinearity between DER and ROA in the exploratory joint model.

4.3.3 Heteroscedasticity Test (Glejser)

Table 7. Glejser Heteroscedasticity Diagnostic

Model	Coeff	Std. Err.	Beta	t	Sig.

Constant	2.078	3.934	-	0.528	0.634
DER	0.001	0.004	0.141	0.264	0.809
ROA	-0.737	0.531	-0.742	-1.390	0.259

Dependent Variable: |Residual|. Source: data processed from PT. KB Bukopin annual reports.

In the Glejser regression using the absolute residuals of the joint model, DER yielded p = 0.809 and ROA yielded p = 0.259. These values do not indicate a clear heteroscedasticity pattern, although the test has very low power with only six observations.

4.4 Hypothesis Testing

4.4.1 Partial Effect of DER on NPM

Table 8. Simple Linear Regression: DER → NPM (raw ratios)

Model	Coeff	Std. Err.	Beta	t	Sig.
Constant	-90.996	41.579	-	-2.188	0.094
DER	0.075	0.040	0.681	1.861	0.136
R	0.681				
R^2	0.464				
Adj R^2	0.330				
Std. Err.	26.664				

Dependent Variable: NPM. Source: data processed from PT. KB Bukopin annual reports.

The exploratory equation using raw ratios is: NPM = -90.996 + 0.075 DER + ε. The DER coefficient is positive but statistically insignificant (t = 1.861, p = 0.136). For reference, the two-tailed critical t value with df = 4 is 2.776, so the coefficient does not meet the conventional 5% threshold. With R^2 = 0.464, DER alone explains 46.4% of the observed NPM variation in this single-bank case, but the result is not strong enough for a confirmatory conclusion. H_1 is therefore not supported statistically and is interpreted only as a provisional directional pattern.

4.4.2 H_2: Partial Effect of ROA on NPM

Table 10. Simple Linear Regression: ROA → NPM (raw ratios)

Model	Coeff	Std. Err.	Beta	t	Sig.
Constant	-2.832	2.991	-	-0.947	0.397
ROA	16.002	1.487	0.983	10.762	0.000
R	0.983				
R^2	0.967				
Adj R^2	0.958				
Std. Err.	6.655				

Dependent Variable: NPM. Source: data processed from PT. KB Bukopin annual reports.

The exploratory equation using raw ratios is: NPM = -2.832 + 16.002 ROA + ε. The ROA coefficient is positive and statistically significant (t = 10.762, p < 0.001), and R^2 = 0.967 indicates a very strong bivariate association within this six-observation case. Even so, the result should be read as case-specific evidence rather than as broadly generalizable proof. H_2 receives exploratory support.

4.4.3 Simultaneous Effect of DER and ROA on NPM

Table 12. Multiple Linear Regression: DER + ROA → NPM (raw ratios)

Model	Coeff	Std. Err.	Beta	t	Sig.
Constant	-20.550	11.853	-	-1.734	0.181
ROA	14.548	1.599	0.894	9.100	0.003
DER	0.017	0.011	0.150	1.532	0.223
R	0.991				
R^2	0.981				
Adj R^2	0.969				
SE	5.756				

Dependent Variable: NPM. Source: data processed from PT. KB Bukopin annual reports.

Table 13. ANOVA F-Test - Exploratory Joint Model

Model	SS	df	MS	F	Sig.
Regression	5207.69	2	2603.84	78.58	0.003
Residual	99.41	3	33.14	-	-
Total	5307.10	5	-	-	-

Predictors: (Constant), DER, ROA. Source: data processed from PT. KB Bukopin annual reports.

The exploratory joint equation using raw ratios is: NPM = -20.550 + 0.017 DER + 14.548 ROA + ε. In the joint model, ROA remains statistically significant (t = 9.100, p = 0.003), whereas DER is not statistically significant (t = 1.532, p = 0.223). The model fit is high (Adjusted R^2 = 0.969) and the overall F-statistic is 78.578 (p = 0.003). For reference, the 5% F-critical value for df1 = 2 and df2 = 3 is 9.552. These results suggest that ROA is the dominant variable in this case, while DER adds limited incremental explanatory power once ROA is included. The pattern is informative but remains exploratory because the sample is extremely small.

4.5 Summary of Hypothesis Test Results

Table 15. Summary of Hypothesis Testing

Hypothesis	Test	Result	Decision
H_1: DER → NPM (partial)	β=0.075; t=1.861; p=0.136	Positive, not significant	Not statistically supported
H_2: ROA → NPM (partial)	β=16.002; t=10.762; p<0.001	Positive, significant	Exploratory support
H_3: DER + ROA → NPM (joint)	F=78.578; p=0.003; Adj. R^2=96.9%	Model significant; only ROA significant	Exploratory model support

Source: SPSS Output, 2022.

5. DISCUSSION

5.1 DER and NPM: Non-Significance and Its Institutional Explanation

The non-significant partial effect of DER on NPM — with the coefficient directionally positive rather than negative — warrants careful institutional interpretation rather than dismissal. In conventional non-financial firm settings, capital-structure studies frequently report that rising leverage can reduce profitability through financing burden and distress costs (Salim & Yadav, 2012; Ayalew & McMillan,

2021). This mechanism is empirically visible at PT. KB Bukopin Tbk., where the bank's Capital Adequacy Ratio (CAR) deteriorated to 10.5% by 2017, barely above the BIS minimum of 8%, reflecting the pressure that weak capitalization and high funding burden can impose on profitability.

However, in commercial banking, leverage simultaneously reflects the scale of deposit intermediation, so a larger liability base may also support revenue generation when funds are productively deployed (Berger, 1995; Gnawali & Niroula, 2024). This dual interpretive channel produces the attenuated and statistically ambiguous partial relationship observed. The positive directionality of β_DER is therefore theoretically coherent within the banking context, even as the non-significance indicates that leverage alone, absent asset efficiency, is an insufficient predictor of margin outcomes.

5.2 ROA and NPM: Asset Efficiency as the Dominant Margin Driver

The strong and statistically significant positive relationship between ROA and NPM confirms that asset efficiency is the primary mechanism through which bank profitability is sustained or eroded at PT. KB Bukopin Tbk. This interpretation is consistent with bank-profitability literature that identifies asset-based performance as a core internal determinant of earnings quality and profitability (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2011).

The mechanism is transparent in the data trajectory: the bank's sustained decline in net income from 2016 through 2020, driven by deteriorating asset quality, rising loan loss provisions, and falling operating revenues, produced a near-perfect co-movement between ROA and NPM. This pattern is consistent with studies showing that ROA tracks the earnings productivity of the balance sheet and thereby helps explain variation in overall bank profitability (Athanasoglou et al., 2008; Soesetio et al., 2022).

5.3 Joint Model Interpretation

The joint-model result should be interpreted cautiously. After recalculation with the raw ratios, the coefficient on DER becomes smaller and remains statistically insignificant, while ROA continues to dominate the model. Rather than claiming a confirmed suppression effect, this study treats the change in DER's coefficient as a provisional specification pattern that may reflect the overlapping relation between leverage, revenue structure, and asset profitability in this single bank.

In substantive terms, the evidence suggests that KB Bukopin's margin deterioration during 2016–2021 was more closely aligned with weak asset returns than with leverage variation alone. This interpretation is consistent with bank-profitability research, but the present data are too limited to establish a stable interaction mechanism.

5.4 Practical Implications

Because this study is exploratory and case specific, the practical implications should be kept narrow. For PT. KB Bukopin Tbk., the consistent ROA-NPM relationship suggests that restoring asset quality, improving revenue productivity, and managing credit costs are more relevant than focusing on DER in isolation. For readers outside this case, the main implication is methodological: profitability analysis in banking should avoid over-reliance on NPM and should be interpreted alongside more standard banking ratios.

6. CONCLUSION

6.1 Conclusions

This study examined the partial and joint associations of Debt Equity Ratio (DER) and Return on Assets (ROA) with Net Profit Margin (NPM) at PT. KB Bukopin Tbk. during 2016–2021. Four conclusions follow. First, DER shows a positive but statistically insignificant bivariate association with NPM, so it cannot be treated as a reliable standalone predictor in this six-observation case. Second, ROA shows a strong positive and statistically significant association with NPM, indicating that asset-return weakness was more closely related to margin deterioration than leverage variation alone. Third, the joint model is statistically strong at the model level, but only ROA remains individually significant; DER does not. Fourth, all results are case-specific and exploratory, given the single-bank design and the very small sample.

6.2 Theoretical and Practical Implications

The contribution of this study is therefore limited and contextual. It provides a case-based illustration of how DER, ROA, and a supplementary NPM measure moved together at PT. KB Bukopin Tbk. during a period of ownership change and pandemic stress. It does not provide a basis for broad theoretical, regulatory, or investment generalization. Its main value lies in clarifying measurement choices in a banking setting and in showing that, within this case, ROA was more informative than DER for explaining bottom-line margin pressure.

6.3 Limitations and Future Research

Four limitations define the boundary conditions of this study and should be kept in view when reading the abstract, discussion, and conclusion. First, the single-firm, six-observation design precludes cross-

sectional generalizability and makes all inferential results fragile. Second, NPM is only a supplementary margin proxy in a banking context and should not replace core banking indicators such as ROA, ROE, NIM, or BOPO. Third, the two-variable specification omits other potentially relevant factors such as asset quality, capital adequacy, funding composition, and operating efficiency. Fourth, future research should extend the analysis to longer panels and broader bank samples rather than relying on one short annual time series.

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