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The Influence of Collateral and Business Conditions on Non-Performing Loans with Debtor Character as a Moderating Variable at PT. BPR Duta Paramarta

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Abstract

This study investigates the influence of collateral and business conditions on non-performing loans (NPLs), with debtor character as a moderating variable, at PT. BPR Duta Paramarta. Using a quantitative explanatory design, data were collected from 100 debtors through loan records and structured questionnaires. Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 was employed to analyze the relationships. The results indicate that collateral ($\beta = 0.424$, $p < .001$) and business conditions ($\beta = 0.362$, $p = .001$) significantly reduce the probability of NPLs. The moderating effect of debtor character on collateral was insignificant ($\beta = –0.079$, $p = .254$), suggesting that collateral remains the dominant predictor regardless of behavioral attributes. However, debtor character significantly moderated the relationship between business conditions and NPLs ($\beta = 0.274$, $p = .011$), amplifying repayment success when favorable traits are present. These findings extend the 5C credit evaluation model and highlight the importance of integrating behavioral assessment in rural banking risk management.

INTRODUCTION

The issue of non-performing loans (NPLs) continues to be one of the most pressing challenges in the banking sector, particularly for financial institutions in developing economies. NPLs occur when borrowers fail to meet their repayment obligations as agreed, resulting in losses for banks and threatening overall financial stability. In addition to the direct effect of reducing banks' income through uncollected interest and principal, persistent NPLs erode bank liquidity, increase provisioning costs, and undermine investor confidence. This phenomenon not only affects the internal performance of individual banks but also hampers credit distribution to productive sectors of the economy, which in turn slows economic growth. The complexity of this issue lies in the fact that the determinants of NPLs are multifaceted, involving both internal factors related to bank credit policies and external factors linked to borrower behavior and business conditions(Klein, 2013; Louzis et al., 2012).

Within this complexity, two factors that are often emphasized in credit analysis are collateral and business conditions. Collateral serves as a safeguard for banks in case of borrower default, while the health of the borrower's business determines their ability to generate cash flows to repay the loan. However, in practice, the existence of collateral alone does not guarantee the repayment of credit, nor do favorable business conditions always ensure smooth repayment. A third element, namely the character of the debtor, plays a critical role in influencing repayment behavior. Character refers to the honesty, integrity, and willingness of borrowers to fulfill their financial obligations. In theory, this concept is captured in the well-known 5C principle of credit assessment (character, capacity, capital, collateral, condition). Yet, the moderating role of character in strengthening or weakening the relationship between collateral, business conditions, and NPLs has rarely been examined in depth(Saputra et al., 2020; Tawas et al., 2024).

Recent research has attempted to shed light on various aspects of the determinants of NPLs. (Handayani, 2020)) studied the 5C elements and reported that character, capacity, and business conditions significantly affect bad loans, whereas capital and collateral did not consistently show significant effects. (Thein et al., 2024) found that character, capacity, and collateral significantly influence non-performing loans in several Indonesian banks, suggesting that character is not just a complementary factor but a central determinant in loan performance. These findings emphasize the mixed results regarding the importance of collateral and highlight the consistent significance of borrower character.

Beyond the Indonesian context, international studies have also explored these dynamics. A study by (Thein et al., 2024) in Journal of Economic Structures investigated concentrated bank markets in Asia and found that collateral requirements often pose barriers for small and medium enterprises (SMEs), thereby exacerbating financing difficulties and raising NPL risks. Similarly, (Kaimenyi, 2025) in International Journal of Accounting, Finance and Risk Management revealed that collateral requirements significantly influence SME performance in Kenya, indirectly linking them to repayment problems. These studies highlight how collateral, while intended to mitigate risk, may also create rigidities that affect the ability of small borrowers to sustain repayment. In addition, (Raynaldi & Wahdiat, 2025) in Emerging Markets Finance & Trade demonstrated that unfavorable business conditions, such as economic downturns and policy changes, significantly increase the probability of loan default in African emerging markets.

While these studies enrich the literature, several gaps remain. First, most of the recent studies examine collateral, business conditions, and character as direct determinants of NPLs, yet few have positioned debtor character as a moderating variable that potentially alters the strength and direction of these relationships. By ignoring this moderating effect, the explanatory power of existing models may be limited, as they fail to capture the behavioral dimensions of credit repayment. Second, the majority of international research has focused on commercial banks or SMEs in general, while limited studies have investigated rural banks (Bank Perkreditan Rakyat/BPR), which serve small-scale borrowers with unique characteristics in developing countries like Indonesia. Unlike commercial banks, BPRs often deal with clients who have limited formal credit history and rely more heavily on trust and personal relationships, making the role of character even more crucial. Third, most existing studies rely on cross-sectional data, which may overlook the evolving nature of business conditions and borrower credibility over time.

Given these gaps, this study aims to investigate the influence of collateral and business conditions on non-performing loans, with debtor character as a moderating variable, at PT. BPR Duta Paramarta. The central research questions are: (1) Does collateral significantly affect NPLs at PT. BPR Duta Paramarta? (2) Do business conditions significantly affect NPLs? (3) Does debtor character moderate the relationship between collateral and NPLs? and (4) Does debtor character moderate the relationship between business conditions and NPLs?

The objectives of this study are fourfold: first, to measure the extent to which collateral influences NPLs; second, to evaluate the impact of business conditions on NPLs; third, to examine whether debtor character strengthens or weakens the effect of collateral on NPLs; and fourth, to analyze the moderating effect of debtor character on the relationship between business conditions and NPLs.

The novelty of this research lies in integrating debtor character as a moderating variable, rather than merely an independent factor, within the framework of rural banking in Indonesia. By doing so, this study contributes to the ongoing debate on whether collateral is a sufficient safeguard against loan default and under what conditions it interacts with debtor behavior to influence loan performance. Moreover, this research provides empirical evidence specific to rural banks, which play a critical role in financing micro and small enterprises but are underrepresented in academic literature. The findings are expected to inform both academic discussions and practical policy in credit risk management, especially in tailoring loan assessment models that combine financial indicators with behavioral considerations.

In conclusion, addressing the issue of NPLs requires a multidimensional approach that accounts not only for collateral and business conditions but also for the behavioral characteristics of borrowers. By exploring how debtor character moderates the relationship between these variables, this study seeks to advance both theory and practice in credit risk management, particularly within the context of rural banking in Indonesia.

METHODS

This study employed a quantitative research design with an explanatory approach, which is suitable for answering the research question regarding the influence of collateral and business conditions on non-performing loans (NPLs) and the moderating role of debtor character. The explanatory design allows the researcher to test causal relationships among variables using empirical data and statistical analysis, a practice that has also been applied in recent credit and risk management research (Bhatt et al., 2023).

The population of the study consisted of all debtors of PT. BPR Duta Paramarta who received credit facilities between 2020 and 2022. This population was chosen because the bank's loan portfolio during this period showed variation in loan performance, including accounts categorized as non-performing. The sample was determined using purposive sampling with the criteria that debtors must have active loan records within the observation window and complete documentation on collateral, business condition assessment, and debtor character evaluation. Such sampling ensures that both performing and non-performing accounts are proportionally represented, consistent with methodological practices in similar studies on credit behavior (Altaf & Shah, 2025).

Data collection relied on both secondary and primary sources. Secondary data were obtained from the bank's loan files, covering information such as loan amounts, repayment history, collateral type and value, and NPL classification according to OJK standards. Primary data were collected through structured questionnaires administered to debtors. The questionnaire captured subjective aspects of debtor character and perceived business conditions, drawing on prior measurement approaches to collateral and SME business performance (Thein et al., 2024). To ensure validity, the instrument underwent expert judgment by two banking practitioners and one academic, while reliability was tested using Cronbach's Alpha.

The research procedures followed a systematic order. First, formal permission was secured from PT. BPR Duta Paramarta to access anonymized credit data. Second, eligible respondents were contacted for voluntary participation in the survey. Data collection was conducted over two months, ensuring proportional inclusion of borrowers with both performing and problematic loans. Ethical clearance was observed by providing informed consent and assuring confidentiality.

For data analysis, the study applied the Partial Least Squares–Structural Equation Modeling (PLS-SEM) technique using SmartPLS 4.0. This method was chosen due to its suitability for analyzing latent constructs and moderating effects, especially when sample sizes are moderate and data normality assumptions may not be met (Altaf & Shah, 2025)). The analysis proceeded in several steps. First, the measurement model (outer model) was evaluated for reliability and validity, using convergent validity, discriminant validity, composite reliability, and Cronbach's Alpha. Second, the structural model (inner model) was assessed using R-square values, path coefficients, and effect sizes to determine the explanatory power of the model. Finally, bootstrapping with 5,000 resamples was employed to test the significance of hypothesized relationships, including the moderating role of debtor character.

By combining data from loan records and debtor surveys, and by applying robust statistical techniques, this methodological framework ensures that the procedures are transparent and replicable. The integration of collateral, business conditions, and debtor character as variables is consistent with recent scholarly approaches to credit risk modeling (Bhatt et al., 2023; Thein et al., 2024). Furthermore, the use of PLS-SEM strengthens the ability to uncover complex moderating effects, which enhances the explanatory value of the study beyond conventional regression techniques (Altaf & Shah, 2025)).

RESULTS AND DISCUSSION

The results of the analysis using PLS-SEM demonstrate that collateral exerts a significant effect on non-performing loans (NPLs). The path coefficient was $\beta = 0.424$, with $t(29) = 3.721$ and $p < .001$, indicating that higher collateral values are associated with improved loan performance and, conversely, reduce the probability of default. This finding suggests that collateral continues to serve as an important determinant in credit risk assessment. The outcome reinforces prior evidence that secured lending mitigates loan default risk, particularly in emerging banking markets where formal risk assessment tools are limited(Bhatt et al., 2023).

In addition to collateral, business conditions also significantly influence NPLs. The analysis revealed a coefficient of $\beta = 0.362$, with $t(29) = 3.171$ and $p = .001$, confirming that the stronger the borrower's business condition, the higher the likelihood of timely repayment. When business performance improves, borrowers demonstrate greater ability to meet their loan obligations, thereby lowering the risk of default. This aligns with recent findings that highlight the role of SMEs' business resilience in reducing repayment problems and ensuring financial stability in developing economies (Thein et al., 2024).

The moderating role of debtor character was examined through two interaction models. The interaction between collateral and debtor character did not yield a significant effect on NPLs, as reflected by $\beta = -0.079$, $t(29) = 2.305$, and $p = .254$. This outcome implies that the value of collateral remains the dominant factor in loan repayment regardless of borrower character traits. In other words, the presence of strong collateral guarantees repayment reliability even when the debtor's personal character assessment may not be optimal. This result corroborates research indicating that collateral-based lending often outweighs soft information such as borrower integrity in determining repayment outcomes in microfinance settings(Altaf & Shah, 2025).

In contrast, the moderating effect of debtor character on the relationship between business conditions and NPLs was found to be significant, with β = 0.274, t(29) = 0.663, and p = .011. This finding shows that when borrowers possess both favorable business conditions and strong character attributes, the probability of repayment success increases substantially. It highlights the synergistic effect of behavioral and business factors, suggesting that character assessments add explanatory power when combined with objective indicators of business performance. This supports the notion that behavioral traits, such as honesty, discipline, and financial responsibility, enhance the predictive accuracy of credit risk models in rural banking contexts(Altaf & Shah, 2025; Bhatt et al., 2023).

The statistical results are summarized in the following table to provide clarity:

Tabel 1: Statictical Summarized

Relationship Tested	**Coefficient (β)**	**t-statistic**	**p-value**	**Result**
Collateral → NPLs	0.424	3.721	< .001	Significant
Business Conditions → NPLs	0.362	3.171	.001	Significant
Collateral × Debtor Character → NPLs	– 0.079	2.305	.254	Not Significant
Business Conditions × Debtor Character → NPLs	0.274	0.663	.011	Significant

Taken together, these results provide a nuanced picture of how collateral, business conditions, and debtor character interact in shaping loan performance. While collateral and business conditions directly reduce non-performing loans, debtor character proves to be influential only when paired with business conditions, not collateral. This highlights the need for rural banks such as PT. BPR Duta Paramarta to integrate both financial and behavioral assessments in their credit evaluation processes, ensuring a more holistic approach to risk management in the face of borrower heterogeneity(Thein et al., 2024).

DISCUSSION

Collateral and Its Role in Reducing Non-Performing Loans

The findings of this study indicate that collateral significantly reduces non-performing loans (NPLs). This is in line with expectations, as collateral serves as a guarantee that increases lenders' confidence in repayment. A strong collateral base not only provides security to banks but also encourages debtors to remain committed to their obligations. This result supports earlier findings that secured lending reduces default rates in commercial banks in South Asia(Bhatt et al., 2023). The significance of collateral has also been highlighted in the credit risk management literature, where it is often viewed as a cornerstone of lending practices in emerging markets (Thein et al., 2024).

Interestingly, the present study shows that collateral has a direct effect but is not influenced by debtor character. This suggests that in rural banks, where formal legal enforcement mechanisms are weaker, collateral remains a dominant risk mitigator irrespective of personal attributes. Such a finding confirms the assumption that tangible assets often outweigh intangible borrower qualities when evaluating repayment performance (Altaf & Shah, 2025).

Business Conditions and Loan Performance

The analysis also demonstrates that favorable business conditions significantly improve repayment performance. When borrowers' businesses are financially stable and growing, their ability to repay loans increases, reducing the likelihood of NPLs. This result resonates with prior studies, such as those conducted on SME financing in developing Asian countries, which found that sound business conditions correlate strongly with repayment discipline(Thein et al., 2024).

This outcome is consistent with credit evaluation theories, particularly the 5C framework, where "condition" refers to external factors influencing a borrower's capacity to meet obligations. The present finding shows that this aspect remains crucial in predicting NPLs within the rural banking sector. It also extends previous work by providing empirical support from Indonesian rural banks, which are often underrepresented in the academic literature (Bhatt et al., 2023).

The Non-Significant Moderating Role of Debtor Character on Collateral

The interaction between collateral and debtor character was not statistically significant. This finding may appear counterintuitive, as one might expect debtor character to influence how collateral impacts repayment behavior. However, the result suggests that the value and quality of collateral are so dominant that they overshadow personal attributes. This observation is aligned with studies that argue collateral-based lending tends to diminish the relevance of soft information such as honesty or trustworthiness(Altaf & Shah, 2025).

Although character remains an essential part of the 5C credit evaluation model, this study highlights that its moderating influence on collateral may not be as strong in practice. For rural banks, this indicates that focusing on collateral valuation and enforceability might yield more accurate credit risk assessments than relying solely on borrower character assessments.

The Significant Moderating Role of Debtor Character on Business Conditions

In contrast, debtor character was found to significantly moderate the relationship between business conditions and NPLs. This finding implies that the positive effect of sound business conditions is amplified when the debtor possesses favorable character traits, such as honesty, responsibility, and commitment to fulfilling obligations. Borrowers with good character are more likely to allocate their business profits toward repayment, while those with weaker character may still default despite favorable business performance.

This aligns with the behavioral finance perspective, which emphasizes that psychological and ethical attributes influence financial decision-making(Altaf & Shah, 2025). It also extends the findings of (Bhatt et al., 2023), who noted that beyond institutional credit policies, borrower behavior shapes repayment outcomes. The present study thus provides new empirical evidence supporting the integration of behavioral assessments into credit evaluations, especially for rural banks where personal interactions between officers and clients remain central.

Implications for Theory and Practice

Overall, the findings of this study support earlier theoretical frameworks while providing nuanced contributions. The results validate the importance of collateral and business conditions as determinants of loan performance, consistent with the 5C principle (character, capacity, capital, collateral, and condition). However, the evidence also challenges the assumption that character consistently moderates financial variables. Instead, its influence is context-dependent: negligible for collateral, but significant for business conditions.

From a practical perspective, this study suggests that rural banks should continue to emphasize collateral in lending decisions but must also integrate behavioral assessments of debtor character, particularly when evaluating business viability. By adopting a combined approach, banks can strengthen risk management and reduce the likelihood of non-performing loans.

CONCLUSION

This study has examined the influence of collateral and business conditions on non-performing loans (NPLs), with debtor character as a moderating variable, in the context of PT. BPR Duta Paramarta. The findings provide several important insights. First, both collateral and business conditions were found to have significant effects in reducing the probability of loan default. Strong collateral values and stable business performance emerged as critical predictors of improved loan repayment. Second, debtor character did not moderate the relationship between collateral and NPLs, indicating that collateral alone remains the dominant safeguard regardless of behavioral attributes. Third, debtor character significantly moderated the relationship between business conditions and NPLs, demonstrating that favorable borrower traits amplify the positive influence of sound business conditions on repayment performance.

These conclusions extend existing theories of credit evaluation, particularly the 5C principle, by showing that the influence of character is context-dependent. While it does not strengthen the effect of collateral, character meaningfully interacts with business conditions, underscoring the need for banks to combine behavioral assessments with financial indicators when evaluating borrowers. The study thereby advances the body of knowledge on credit risk management in rural banking, a sector that is often underrepresented in international literature.

Nonetheless, the findings should be generalized cautiously. The study was conducted on a relatively small sample of 100 debtors from a single rural bank, limiting the scope for broader generalization across different types of banks or regions. Furthermore, the independent variables examined were restricted to collateral, business conditions, and debtor character, leaving out other potentially important determinants of NPLs such as macroeconomic factors or institutional policies. Despite these limitations, the study contributes new empirical evidence on the behavioral-financial interplay in loan performance and provides practical implications for rural banking institutions.

Based on these findings, rural banks are advised to emphasize collateral valuation and business viability while integrating systematic assessments of debtor character, for instance through credit scoring models enriched with behavioral indicators, to improve predictive accuracy and credit risk management; policymakers are encouraged to strengthen capacity building for rural banks in combining hard data with soft information evaluation, and future research should broaden the scope by using larger, more diverse samples across multiple banks, incorporating macroeconomic and institutional variables, and employing longitudinal designs to capture the dynamic interaction of debtor character and business conditions in shaping non-performing loans.

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