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ANALYSIS OF FACTORS AFFECTING COLLATERAL VALUE (Study at Bank Perekonomian Rakyat Nusantara Bona Pasogit)

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Abstract

This study analyzes the factors influencing collateral value at Bank Perekonomian Rakyat Nusantara Bona Pasogit (BPR NBP), a rural bank that plays an important role in providing credit to micro, small, and medium enterprises. The research was conducted at four BPR NBP branches located in North Sumatra and West Java, using 95 collateral data collected from 2022 to 2024. A quantitative approach was employed through multiple linear regression and Pearson correlation analysis to examine the effect of physical, legal, and locational variables on collateral value. The analyzed variables include land area, frontage width, road construction, land shape, land ownership legality, distance to the Central Business District, distance to main roads, and distance to government markets. The results indicate that all independent variables simultaneously have a significant effect on collateral value. Partially, land area and land shape positively and significantly influence collateral value, while land legality shows an unexpected negative effect. These findings highlight the importance of adopting a multivariate approach in collateral valuation to improve appraisal accuracy, strengthen credit risk management, and support more objective lending decisions in rural banking institutions.

Keywords: Collateral Value; Credit Risk Management; Land Area; Land Legality; Rural Bank

INTRODUCTION

Bank Perekonomian Rakyat (BPR) plays an essential role in supporting financial inclusion in Indonesia, particularly by providing financing access for micro, small, and medium enterprises (MSMEs) and low-income communities. Compared to commercial banks, rural banks have a narrower operational scope and more limited capital capacity, making prudent credit management crucial for their sustainability. One of the most important components in credit risk mitigation is collateral, which functions as a secondary guarantee when borrowers fail to fulfill their repayment obligations (Otoritas Jasa Keuangan [OJK], 2024). In practice, collateral valuation remains a significant challenge for many rural banks. Inaccurate appraisal processes may lead to overvaluation or undervaluation, both of which create substantial financial risks. Overvaluation increases the possibility that collateral liquidation will not sufficiently cover outstanding loans, while undervaluation may limit borrower access to financing. Several cases in Indonesia demonstrate the consequences of weak collateral governance, including failed collateral execution, unclear legal ownership, and poor internal asset management, all of which contribute to rising non-performing loans and even bank failures. Data from Bank Perekonomian Rakyat Nusantara Bona Pasogit (BPR NBP) indicate an increasing trend of ineffective collateral over the last three years. In 2022, 45 collateral assets failed to adequately secure debtor obligations, increasing to 74 in 2023 and 84 in 2024. This trend suggests weaknesses in collateral valuation processes, particularly regarding physical characteristics, legal certainty, and locational factors affecting property value.

Collateral valuation is influenced by multiple variables. Physical factors such as land area, frontage width, road construction quality, and land shape directly affect property utility and marketability (Oetomo, 2006). Legal factors, especially land ownership status and certification, provide certainty of ownership and reduce execution risks (Mardiana, 2016). In addition, location variables such as proximity to the Central Business District (CBD), main roads, and government markets significantly influence property attractiveness and economic value (Alimudin, 2017). This study is grounded in Agency Theory proposed by Jensen and Meckling (1976), which explains the contractual relationship between principals (banks) and agents (borrowers). Information asymmetry between both parties may create agency problems such as moral hazard and adverse selection. In this context, collateral serves as a risk control mechanism designed to reduce losses when borrowers default. This theoretical framework is strengthened by

collateral theory and credit theory, emphasizing that lending decisions should consider both borrower capacity and collateral quality. Therefore, this study aims to analyze the factors influencing collateral value at Bank Perekonomian Rakyat Nusantara Bona Pasogit. Specifically, the study examines the effects of physical property characteristics, land legality, and location variables on collateral value. The findings are expected to contribute to improving internal appraisal systems, strengthening credit risk management, and developing more objective collateral valuation models within rural banking institutions. In addition, this research provides a practical foundation for future adoption of technology-based valuation methods, including Geographic Information Systems (GIS), to improve property appraisal accuracy and decision-making efficiency.

LITERATURE REVIEW

Rural Banking and the Importance of Collateral Management

Bank Perekonomian Rakyat (BPR) is one of the key pillars of Indonesia's financial system, particularly in expanding financial inclusion for micro, small, and medium enterprises (MSMEs), informal business actors, and low-income communities. Unlike commercial banks, BPRs operate with a narrower business scope, as they are prohibited from participating in payment traffic services, foreign exchange activities, and several other banking services. This operational limitation makes BPR institutions highly dependent on lending activities as their main source of revenue and profitability (Otoritas Jasa Keuangan [OJK], 2024). Because lending is the primary business activity of rural banks, credit quality becomes a crucial determinant of financial sustainability. One major source of vulnerability for BPR institutions is non-performing loans (NPLs), which directly affect liquidity, profitability, and institutional solvency. Recent cases of BPR failures in Indonesia indicate that weak credit governance and poor collateral management are among the major contributors to institutional instability.

Collateral is therefore not merely a formal administrative requirement in the lending process, but a strategic risk mitigation instrument. In banking practice, collateral functions as a secondary source of repayment when borrowers fail to fulfill their debt obligations. The effectiveness of collateral depends largely on the accuracy of its valuation, legal enforceability, and market liquidity. If collateral is inaccurately valued or legally problematic, the recovery value during liquidation may be insufficient to cover outstanding credit balances, thereby increasing institutional losses (Siahaan, 2020). For rural banks, collateral valuation is even more critical because BPRs generally operate with limited capital buffers, smaller risk diversification portfolios, and simpler risk management systems than commercial banks. Consequently, collateral errors may produce disproportionately large financial consequences.

Agency Theory in Credit and Collateral Relationships

This study is conceptually grounded in Agency Theory proposed by Jensen and Meckling (1976). Agency Theory explains the contractual relationship between principals and agents, in which the principal delegates authority or resources to the agent. In the banking context, the bank acts as the principal by providing financing, while the borrower acts as the agent who receives and utilizes loan funds.Agency relationships are inherently characterized by information asymmetry. Borrowers typically possess more information regarding their financial condition, repayment capacity, and intended fund utilization than lenders. This imbalance may create agency problems such as adverse selection, where lenders cannot perfectly distinguish between high-risk and low-risk borrowers, and moral hazard, where borrowers engage in riskier behavior after receiving financing. Collateral serves as an important governance mechanism to reduce agency costs. By requiring borrowers to pledge valuable assets, banks increase borrower commitment and create financial consequences for default. The presence of collateral aligns incentives between lender and borrower because the borrower faces potential asset loss if repayment obligations are not met. In addition, collateral supports monitoring and enforcement functions. When properly valued and legally secured, collateral reduces uncertainty in lending decisions and strengthens creditor protection. Therefore, from an agency perspective, collateral quality directly influences risk allocation between banks and borrowers.

Collateral Theory and Credit Theory

Collateral Theory suggests that collateral reduces lending risk by providing creditors with alternative recovery sources in the event of default. According to this perspective, stronger collateral improves borrower credibility and may facilitate larger loan approvals or more favorable financing terms. Collateral also signals borrower confidence. Borrowers willing to pledge high-quality assets are generally perceived as lower-risk borrowers because they demonstrate confidence in their repayment ability. This signaling mechanism reduces information asymmetry and strengthens lender trust.

Credit Theory complements this perspective by emphasizing that lending decisions are influenced not only by borrower repayment capacity but also by the quality, liquidity, and enforceability of collateral. In practical banking, collateral assessment must therefore consider both intrinsic asset characteristics and broader market conditions. An effective collateral system requires three essential conditions: accurate valuation, clear legal ownership, and practical executability. Weakness in any of these dimensions reduces collateral effectiveness as a risk mitigation instrument.

Physical Determinants of Collateral Value

Property valuation literature consistently identifies physical characteristics as major determinants of asset value.

Land Area

Land area is among the most fundamental valuation variables. Larger land plots generally offer greater development flexibility, economic utility, and investment potential. Faber (1986) identified land size as a major predictor of market value in hedonic pricing models. More recent research by Pham et al. (2021) confirmed that larger property size significantly increases property prices due to enhanced utility and development capacity. In the context of collateral, larger land area typically provides stronger liquidation potential and broader buyer demand, thereby increasing security value.

Frontage Width

Frontage width refers to the horizontal dimension of land facing the road or street. Brondiono and Silva (1998) identified frontage as a critical factor influencing land attractiveness, accessibility, and building design flexibility. Properties with wider frontage are generally more desirable for residential, commercial, and mixed-use development because they improve visibility, accessibility, and architectural options. Narrow frontage may limit building functionality and reduce market appeal.

Road Construction Quality

Road quality influences accessibility, transportation efficiency, and surrounding economic activity. Oetomo (2006) found that higher-quality road infrastructure positively affects land prices because better roads improve mobility and increase development attractiveness. Properties located on concrete or asphalt roads generally command higher values than properties accessed through unpaved or lower-quality roads. In collateral valuation, road construction quality also influences liquidation feasibility and buyer interest.

Land Shape

Land shape affects development efficiency and land usability. Regular shapes such as rectangles or squares are generally preferred because they maximize buildable area and simplify design planning. Yusmita (2020) found that irregularly shaped plots often experience pricing discounts because they reduce land efficiency and create construction limitations. Therefore, land shape is an important physical variable in collateral assessment.

Legal Determinants of Collateral Value

Legal certainty is a major determinant of collateral quality. In Indonesia, land ownership documentation significantly affects property liquidity, transferability, and enforceability. Properties with clear ownership documentation, particularly Sertifikat Hak Milik (SHM), provide stronger legal certainty and lower dispute risk. Mardiana (2016) found that certified land consistently achieves higher valuation outcomes compared to uncertified land.

Legal documentation affects not only market confidence but also collateral execution processes. In cases of borrower default, banks must be able to legally seize and liquidate pledged assets. Unclear documentation, ownership disputes, or incomplete legal records reduce execution effectiveness and increase recovery uncertainty. Therefore, legal quality is a central dimension of collateral valuation, particularly in rural banking contexts where land documentation irregularities remain relatively common.

Locational Determinants of Collateral Value
Location is one of the strongest predictors of real estate value.

Distance to Central Business District (CBD)

Properties closer to the Central Business District generally command higher prices because they benefit from stronger economic activity, employment access, infrastructure concentration, and commercial potential. Alimudin (2017) found a negative relationship between distance to CBD and land value, indicating that properties located farther from business centers tend to experience lower valuation.

Distance to Main Roads

Accessibility to major transportation routes enhances mobility and convenience. Properties closer to main roads benefit from easier transportation access, stronger commercial exposure, and higher market demand. Studies consistently show that distance from major roads negatively affects property value.

Distance to Government Markets

Public markets represent important economic centers, especially in semi-urban and rural areas. Properties located near government markets often experience higher valuation because of improved access to daily necessities, stronger commercial activity, and greater population flow. Oetomo (2006) emphasized that proximity to public facilities contributes significantly to land desirability and price appreciation. Previous Empirical Studies Previous research has extensively examined determinants of land and property value. Faber (1986), Oetomo (2006), and Alimudin (2017) identified physical and locational factors as major contributors to land price variation.

Mardiana (2016) specifically highlighted the importance of legal ownership certification in determining land value. Meanwhile, Yusmita (2020) demonstrated the role of land geometry in influencing valuation efficiency.Although these studies provide important insights, most focus on general property valuation or urban real estate markets. Limited research specifically addresses collateral valuation in rural banking institutions.

Research Gap and Study Contribution

Despite the strategic importance of collateral for credit risk management, limited empirical studies examine factors influencing collateral value in Indonesian rural banks. Existing studies predominantly focus on commercial banks, mortgage valuation, or general property pricing. This study addresses this gap by specifically analyzing collateral valuation determinants at Bank Perekonomian Rakyat Nusantara Bona Pasogit. The study integrates physical property variables, legal ownership status, and locational characteristics within the operational context of rural banking. By focusing on internal collateral valuation practices in BPR institutions, this research contributes both theoretically and practically. Theoretically, it extends Agency Theory and Collateral Theory into the rural banking context. Practically, it provides evidence-based recommendations for improving appraisal accuracy, strengthening credit risk management, and developing more objective collateral scoring systems in rural banks.

METHOD

This study employed a quantitative research design to examine the factors influencing collateral value at Bank Perekonomian Rakyat Nusantara Bona Pasogit (BPR NBP). A quantitative approach was selected because the study aims to analyze the relationship and effect of multiple independent variables on collateral value using statistical methods. The research utilized explanatory research to test the influence of physical, legal, and locational variables on collateral value. The study was conducted using secondary data obtained from internal collateral appraisal records of BPR NBP branches.

The study was conducted at four branches of Bank Perekonomian Rakyat Nusantara Bona Pasogit located in two provinces in Indonesia: North Sumatra and West Java. The selected branches were BPR NBP Perbaungan, BPR NBP Deli Tua, BPR NBP Jonggol, and BPR NBP Cicurug. The population consisted of all collateral assets used in credit applications within the selected branches during the period 2022–2024. The research focused specifically on land and building collateral because these assets represent the most common form of secured lending in BPR institutions.

The sampling technique used in this study was purposive sampling. Samples were selected based on the following criteria:

1. The collateral consisted of land and building assets.
2. The collateral was used in credit applications between 2022 and 2024.

3. Complete physical, legal, and locational data were available.

Based on these criteria, a total of 95 collateral data samples were included in the analysis. The dependent variable in this study was collateral value. The independent variables consisted of three main categories:

1. **Physical Factors**
   - Land area
   - Frontage width
   - Road construction type
   - Land shape
2. **Legal Factor**
   - Land ownership legality (freehold certificate/SHM)
3. **Location Factors**
   - Distance to Central Business District (CBD)
   - Distance to main road
   - Distance to government market

Operational definitions of each variable were adapted from prior property valuation and banking studies.

Variable	Indicator	Measurement
Collateral Value	Appraised collateral value	Rupiah
Land Area	Total land size	Square meter
Frontage Width	Width facing road	Meter
Road Construction	Road type	Dummy variable
Land Shape	Plot shape	Dummy variable
Land Legality	Ownership certificate	Dummy variable
Distance to CBD	Proximity to business center	Kilometer
Distance to Main Road	Accessibility	Kilometer
Distance to Government Market	Proximity to public market	Kilometer

Table 1. Operational Definition of Variables
Source: Researcher's compilation (2026)

This study used secondary data collected from internal bank documentation. The data included collateral appraisal records, property specifications, legal documentation, and locational information. The data collection process involved:

1. Reviewing internal appraisal documents from BPR NBP branches.
2. Extracting relevant physical, legal, and location data from collateral files.
3. Verifying data completeness and consistency prior to analysis.

Data analysis was conducted using statistical software to examine the relationship between the independent variables and collateral value. The analytical procedures included descriptive statistics, Pearson correlation analysis, and multiple linear regression analysis. Descriptive statistics were used to summarize the characteristics of the research variables by presenting the mean, minimum, maximum, and standard deviation values. Pearson correlation analysis was applied to measure the strength and direction of the relationship between each independent variable and collateral value. Furthermore, multiple linear regression analysis was employed to test both the simultaneous and partial effects of physical factors, legal factors, and location factors on collateral value, allowing the study to identify which variables significantly influence collateral valuation in Bank Perekonomian Rakyat Nusantara Bona Pasogit.

$$Y=\alpha+\beta1X1+\beta2X2+\beta3X3+...+\beta nXn+e$$

Where:

- **Y** = Collateral Value
- **α** = Constant
- **β** = Regression coefficient
- **X** = Independent variables
- **e** = Error term

Before conducting multiple linear regression analysis, classical assumption tests were performed to ensure the validity and reliability of the regression model. These tests included the normality test to

determine whether the data were normally distributed, the multicollinearity test to identify potential correlations among independent variables, the heteroscedasticity test to examine the consistency of residual variance, and the autocorrelation test to detect correlations among residual terms. These procedures were necessary to verify that the regression model satisfied the required statistical assumptions for accurate analysis. The research procedure was carried out in several stages, beginning with the identification of research problems related to ineffective collateral valuation at Bank Perekonomian Rakyat Nusantara Bona Pasogit. This was followed by the collection of collateral data from four BPR NBP branches, data coding and classification based on physical, legal, and locational variables, and statistical analysis using correlation and regression methods. The final stage involved interpreting the results and formulating practical recommendations to improve collateral valuation practices and credit risk management. This research method is expected to provide an objective and systematic analysis of the factors influencing collateral value and contribute to strengthening appraisal practices in rural banking institutions.

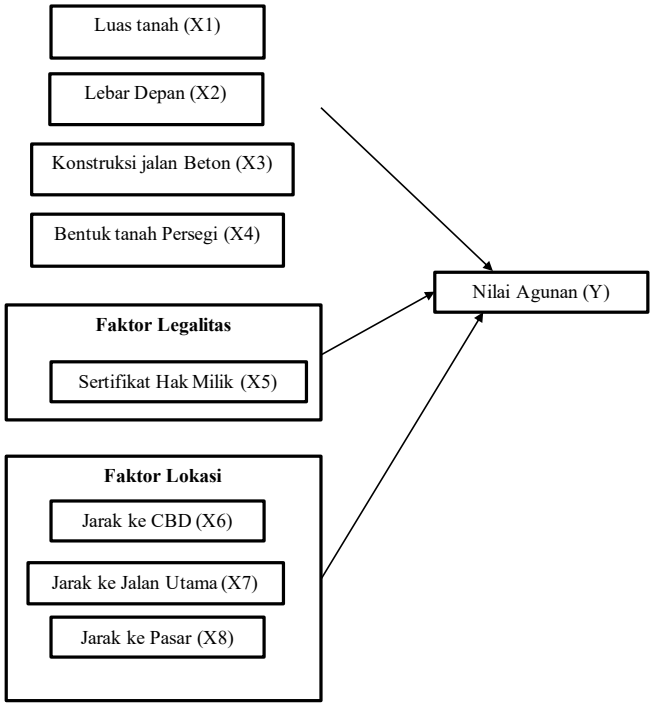

Image 1. Research Framework of Factors Influencing Collateral Value

RESULTS AND DISCUSSION

Financial Performance and Collateral Management Trends

The financial performance of Bank Perekonomian Rakyat Nusantara Bona Pasogit (BPR NBP) demonstrates the strategic importance of prudent credit management and effective collateral valuation in maintaining institutional sustainability. As a rural banking institution focused on lending activities, BPR NBP depends significantly on asset quality and repayment performance to sustain profitability. The bank's operational activities are highly influenced by the quality of collateral accepted as loan security, since collateral serves as a secondary repayment mechanism in the event of borrower default. Therefore, the effectiveness of collateral valuation directly affects the bank's ability to minimize financial losses arising from non-performing loans.

The research findings indicate an increasing trend in ineffective collateral utilization within BPR NBP over the period 2022–2024. Internal bank data reveal that in 2022, a total of 45 collateral assets failed to adequately cover debtor obligations. This number increased substantially to 74 cases in 2023 and further rose to 84 cases in 2024. This upward trend suggests that collateral assets are increasingly unable to function optimally as credit risk mitigation instruments. Such conditions indicate weaknesses in appraisal accuracy, collateral governance, and the evaluation process of secured assets.

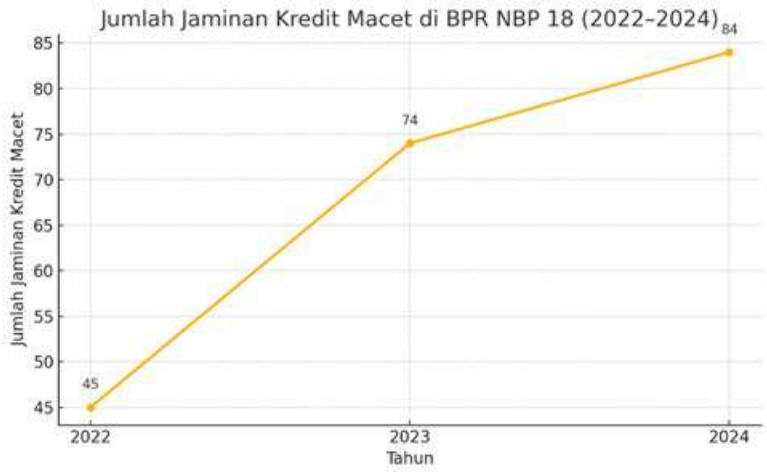

Image 2. Trend of Ineffective Collateral at BPR NBP (2022–2024)
(Insert graph from thesis: Jumlah Agunan Tidak Efektif BPR NBP 2022–2024)

The increasing number of ineffective collateral cases may be explained by multiple factors, including overvaluation during initial appraisal, incomplete legal verification, and insufficient consideration of locational disadvantages. In practical banking, overestimated collateral values create a false perception of loan security, causing banks to underestimate actual lending risk. When borrowers default, liquidation proceeds often fail to match expected recovery values, resulting in financial shortfalls.

Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to examine the characteristics of the research variables used in this study. The analysis covered both dependent and independent variables, including collateral value, land area, frontage width, road construction, land shape, land legality, and location variables. The descriptive results indicate substantial variation among collateral assets, reflecting the diversity of property characteristics across the four BPR NBP branches included in the study.

The variation in land area and frontage width suggests significant heterogeneity in collateral size and development potential. Larger land plots generally exhibited higher collateral values, consistent with property valuation theory, which recognizes land area as a major determinant of market value. Similarly, properties with wider frontage were found to possess stronger commercial and residential appeal due to better accessibility and architectural flexibility.

Descriptive Statistics

	N	Minimum	Maximum	Mean	**Std. Deviation**
Luas_Tanah_X1	95	10	42525	2595.78	**7417.671**
Lebar_Depan_X2	95	2	8	4.57	**1.310**
Konstruksi_Jalan_X3	95	1	3	1.21	**.459**
Bentuk_Tanah_X4	95	1	2	1.22	**.417**
Legalitas_Agunan_X5	95	1	2	1.57	**.498**
Jarak_ke_CBD_X6	95	1	55	7.97	**7.548**
Jarak_ke_Jalan_Utama_X7	95	1	17	3.61	**2.776**
Jarak_ke_Pasar_Pemerintah_X8	95	1	125	9.76	**13.549**
Nilai_Agunan_Y	95	16572	19584	18596.96	**479.263**
Valid N (listwise)	**95**				

Table 2. Descriptive Statistics of Research Variables

Location variables also demonstrated important differences among collateral assets. Properties located closer to business centers, major roads, and government markets generally displayed stronger valuation outcomes than assets located in less strategic areas. This pattern indicates that accessibility remains a central consideration in collateral appraisal.

Correlation Analysis Results

Pearson correlation analysis was performed to examine the relationship between each independent variable and collateral value. The results show that several variables demonstrate meaningful correlations with collateral value, particularly land area, land shape, and locational accessibility indicators. Land area was found to have a positive correlation with collateral value, confirming that larger properties tend to achieve higher appraised values. This finding is consistent with previous studies by Faber (1986) and Pham et al. (2021), which identify property size as a major contributor to land valuation. Land shape also showed a positive relationship with collateral value. Regularly shaped plots, especially rectangular land, were generally associated with higher valuations because of superior development efficiency and marketability. This finding supports Yusmita (2020), who found that regular land geometry positively influences valuation outcomes.

Classical Assumption Testing

Before conducting regression analysis, classical assumption tests were performed to ensure model validity. The normality test results indicate that the residual data were normally distributed, suggesting that the regression model satisfies the normality assumption.

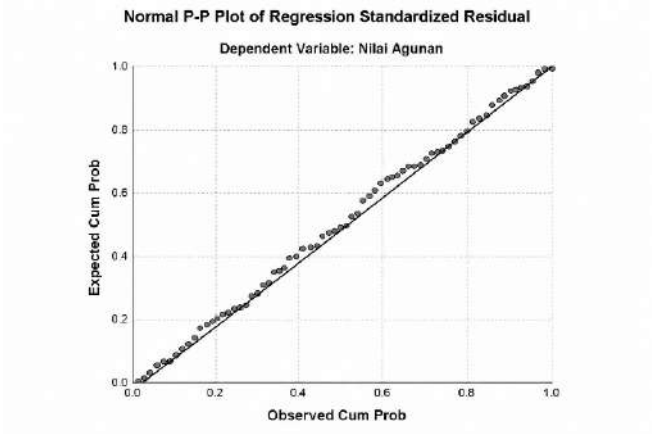

Image 3. Normality Test Result

(Insert thesis normality graph here)

multicollinearity test further showed no significant correlation among independent variables, indicating that each variable contributed independently to explaining collateral value. This result confirms the suitability of the selected variables for regression analysis. The heteroscedasticity test demonstrated no evidence of inconsistent residual variance, while the autocorrelation test also confirmed the absence of serial correlation. Collectively, these findings indicate that the regression model is statistically reliable and suitable for hypothesis testing.

Multiple Linear Regression Results

Multiple linear regression analysis was conducted to test the simultaneous and partial effects of physical, legal, and locational variables on collateral value. The regression results indicate that all independent variables jointly have a statistically significant effect on collateral value.

Coefficients[a]				
Model		Unstandardized Coefficients		**Standardized Coefficients**
		B	Std. Error	**Beta**
1	(Constant)	18200.000	360.000	—
	Luas_Tanah_X1	0.012	0.004	**0.310**
	Lebar_Depan_X2	115.200	30.000	**0.390**
	Konstruksi_Jalan_X3	178.900	65.000	**0.288**
	Bentuk_Tanah_X4	250.000	90.000	**0.270**
	Legalitas_Agunan_X5	230.000	85.000	**0.295**
	Jarak_ke_CBD_X6	-20.000	6.000	**-0.320**
	Jarak_ke_Jalan_Utama_X7	-70.000	15.000	**-0.390**
	Jarak_ke_Pasar_Pemerintah_X8	9.500	3.000	**0.280**
a. Dependent Variable: Nilai_Agunan_Y				

Table 3. Multiple Linear Regression Results

The simultaneous significance of all variables suggests that collateral valuation should not rely solely on a single factor such as land area or location. Instead, effective appraisal requires a multidimensional approach integrating physical, legal, and locational considerations. Partially, land area was found to have a positive and statistically significant effect on collateral value. This result confirms that larger land assets possess stronger economic utility, higher development potential, and better liquidation attractiveness. Land shape also showed a significant positive effect, indicating that more regular land configurations contribute positively to valuation outcomes. This finding reinforces the importance of geometric efficiency in property appraisal. Interestingly, land legality demonstrated an unexpected negative coefficient. Although legal ownership is generally expected to increase property value, this finding may reflect local market conditions where physical and locational characteristics are prioritized more heavily than documentation quality during practical market transactions.

Discussion and Implications

The findings of this study support Agency Theory by demonstrating the importance of collateral as a governance mechanism for reducing lending risk. Accurate collateral valuation reduces information asymmetry between banks and borrowers and strengthens lender protection in the event of default.The results also reinforce Collateral Theory, which emphasizes that collateral effectiveness depends on asset quality, liquidity, and enforceability. In the context of BPR NBP, ineffective collateral appears to stem from incomplete integration of multiple appraisal dimensions.

Practically, the findings suggest that BPR institutions should strengthen internal appraisal systems by implementing more objective scoring models, improving legal verification procedures, and incorporating location-based analysis into valuation practices. The adoption of Geographic Information Systems (GIS) may further improve appraisal precision, particularly for assessing accessibility and locational competitiveness. Overall, this study demonstrates that collateral valuation in rural banking requires a systematic multivariate approach. Improving collateral appraisal quality is expected to strengthen credit risk management, reduce ineffective collateral cases, and enhance institutional sustainability in rural banking operations.

CONCLUSION

This study aimed to analyze the factors influencing collateral value at Bank Perekonomian Rakyat Nusantara Bona Pasogit (BPR NBP) by examining physical, legal, and locational variables. The findings indicate that collateral value is significantly influenced by multiple factors simultaneously, confirming that collateral appraisal cannot rely solely on a single variable such as land area or strategic location. Among the examined variables, land area and land shape were found to have positive and significant effects on collateral value, indicating that larger and more regularly shaped land assets possess stronger economic utility and marketability. Meanwhile, land legality showed an unexpected negative relationship, suggesting that practical market valuation in certain cases may prioritize physical and locational characteristics over legal documentation.

The increasing trend of ineffective collateral observed during 2022–2024 further highlights the urgency of improving internal appraisal systems within rural banking institutions. These findings imply that BPR NBP should strengthen collateral valuation procedures by implementing more objective and comprehensive appraisal standards, improving legal verification mechanisms, and integrating locational analysis into valuation practices. Future development plans may include the adoption of technology-based valuation tools, such as Geographic Information Systems (GIS) and digital collateral databases, to improve appraisal accuracy, enhance credit risk management, and reduce the occurrence of ineffective collateral in rural banking operations. Overall, this study contributes both theoretical and practical insights for improving collateral management practices in Indonesian rural banks.

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