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Review of the Financial Health of Bank during Increasing Foreclosed Assets and the Application of Analytic Hierarchy Process (AHP) in Selecting Strategies to Reduce Them

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ABSTRACT: PT Bank Laju International Tbk (the Bank) has struggled with its increased foreclosed assets, particularly those originating from mortgage loans, which could affect its financial health. The research assessed Bank's financial health using Risk Based Bank Rating (RBBR) framework by analysing key financial ratios and investigating the root causes of rising foreclosed assets through Fishbone and Pareto analysis. Key factors include customer income instability, slow progress in selling foreclosed assets, and lack of insurance protection during economic downturns. To select effective strategies for managing foreclosed assets, the research utilized Analytic Hierarchy Process (AHP), a Multi-Criteria Decision-Making method, to evaluate multiple alternatives based on various criteria, which were derived from Focus Group Discussion (FGD) with Bank's officers, who directly involved in mortgage loans and foreclosed assets activities, also reference with Bank's SWOT analysis. The research evaluated three alternatives strategy:

1. Protection Insurance for Customer's Mortgage Loans.
2. Actively Partnering with property agents to accelerate sale of foreclosed assets as-is.
3. Collaborating with property agents to renovate foreclosed assets.

The result showed that despite the increase in foreclosed assets, the Bank remains financially sound, with key financial ratios within acceptable regulatory limits. AHP analysis revealed that alternative 1 stands in first place to be prioritized, followed by alternative 2, however between both alternatives indicates a very small difference in prioritization weight, which means that both strategies are important to be executed and prioritized. Proposal to implement both alternatives in parallel would be a very effective strategy, where alternative 1 conduct as Preventive Strategy in preventing customer's mortgage loans defaults, while alternative 2 as Corrective Strategy in lowering foreclosed assets volume. Alternative 3 acts as a complement strategy, where renovating foreclosed assets could facilitate quicker sales, however it'll take longer time for renovation itself.

KEYWORDS: Foreclosed Assets, Mortgage Loans, Strategy Prioritization, Decision Making, Analytic Hierarchy Process

INTRODUCTION

The community strives to have a place to live, one of them by purchasing a property through mortgage loans, which is a loan facility from a bank. This loan facility to customers is a productive asset as it generates income for the bank. With the growing of middle class and urbanization trends in Indonesia, the demand for housing has surged, leading to an increase in mortgage loans extended by banks. What eases with mortgage loans, for example, customers don't have to provide cash funds to buy a house, only down payment and then pay instalments. *On the other hand, what becomes burdensome for banks, is if customers fail to pay instalments, then the mortgage loans fall into bad debt (or known as non-performing loans or NPL) and to recover the bad debt, banks start the initial process for foreclosure by taken over the house as foreclosed assets. Lately, foreclosed assets have increased in banking industry in Indonesia.* The NPL are triggered when the customers are unable to pay instalments. Economic downturns, rising unemployment rates, inflation and interest rates can negatively impact customers' ability to repay their mortgage loans, which leading to default. The COVID-19 pandemic has also had a significant impact on the economy, leading to job losses and reduced income for many households. Understanding the issue of increasing foreclosed assets in banking industry in Indonesia is importance to the extend for several reasons, such as:

1) It can weaken banks' performance, potentially leading to financial instability and systemic risks.

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2) For customers, the foreclosure of their homes can be a devastating experience. *It's essential to explore strategies that protect customers from mortgage default and prevent mortgage loans from becoming foreclosed assets.*

PT Bank Laju International Tbk has experienced increasing in its mortgage loans with CAGR of 19.1% throughout 2019 to 2023. Following that, Bank also experienced a steady rise of its foreclosed assets. The surge in foreclosed assets and the problem in mortgage loan defaults potentially impacted to Bank's key financial indicator such as NPL ratio.
Problem identification or business issue: the Bank has difficulties in mitigating the increased of its foreclosed assets amount as seen from Table 1. Comparison of 10 banks with the largest Foreclosed Assets in Indonesia. As the volume of foreclosed assets rises, the Bank is accumulating a greater amount of non-productive assets. Foreclosed assets growth is not only reduced profitability but also potentially threatens Bank's financial soundness. ***The Bank's current strategies might be insufficient to address foreclosed assets increased, particularly those originating from mortgage loans, therefore a reassessment of Bank's strategies is necessary to select strategies in reducing foreclosed assets from mortgage loans and preventing mortgage loans from becoming foreclosed assets.***

Table 1. Comparison of 10 banks with the highest Foreclosed Assets in Indonesia

Banks	2019		2020		2021		2022		2023		CAGR
	IDR trillion	Rank	IDR trillion	Rank	IDR trillion	Rank	IDR trillion	Rank	IDR trillion	Rank	
BANK A	1.4	1	1.6	3	1.5	2	1.6	1	1.6	3	+3%
BANK B	1.3	2	1.8	2	1.5	3	1.1	5	0.8	5	-11%
BANK C	1.0	3	1.4	5	1.2	5	1.5	3	1.7	1	+14%
BANK LAJU	1.1	4	1.1	6	1.2	6	1.6	2	1.7	2	+12%
BANK D	0.9	5	0.7	8	0.6	8	0.5	7	0.5	7	-14%
BANK E	0.7	6	1.6	4	1.3	4	1.4	4	1.3	4	+17%
BANK F	0.5	7	0.7	7	0.7	7	0.8	6	0.7	6	+9%
BANK G	0.5	8	0.4	9	0.1	13	0.1	13	0.1	13	-33%
BANK H	0.3	9	0.2	10	0.2	9	N.A	N.A	N.A	N.A	NA
BANK I	0.2	10	18.0	1	10.1	1	0.3	8	0.3	8	+11%

Research Objectives will be (i) review soundness of Bank's NPL during the increasing of foreclosed assets, (ii) investigate possible root causes of increasing foreclosed assets that originating from mortgage loans, and (iii) deliver the strategies in reducing foreclosed assets that originating from mortgage loans and in preventing mortgage loans from becoming foreclosed assets.

Research Scope will be (a) primarily concentrate on the Bank, particularly in foreclosed assets increment that originating from mortgage loans, (b) focus on data from 2019-2023 to analyze trends and changes particularly in the mortgage loans landscape, (c) rely on publicly available data and information of the Bank, Regulator, and industry reports. Also FGD with Bank's officials and customers were conducted to gather qualitative data, (d) analyze financial soundness of the Bank during the foreclosed assets increased and application of AHP in selecting strategy to reduce the amount of foreclosed assets that originating from mortgage loans and to prevent mortgage loans from becoming foreclosed assets, and (e) explore and deliver the possible strategies, particularly in reducing foreclosed assets that originating from mortgage loans and in preventing mortgage loans from becoming foreclosed assets.

LITERATURE REVIEW

A. RBBR framework was used in an assessed the bank's health through four factors, namely:

(1) Risk Profile, which will measure credit risk using NPL ratio. NPL are a critical issue in the Indonesian banking industry, defined as loans for which the customer has not made the agreed-upon payments for 90 days or more. The NPL ratio is expressed in %, calculated and categorized as follow:

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Table 2. Formulation and Categories of NPL

$$NPL = \frac{\text{Total Non-Performing Loans}}{\text{Total Bank's Loans}} \times 100\%$$

Categories	Condition
Very Healthy	NPL < 2%
Healthy	2% ≤ NPL < 5%
Less Healthy	5% ≤ NPL < 8%
Unhealthy	8% ≤ NPL < 12%
Very Unhealthy	NPL ≥ 12%

Several factors contribute to the emergence of NPL, such as (i) economic downturns significantly impact customers' ability to repay loans, leading to an increase in NPL, (ii) Poor credit risk assessment and management practices by banks further exacerbate this issue, resulting in lending to high-risk customers, and (iii) There are elements that are cannot be predicted at the beginning, such as a condition (i.e crisis, pandemic, etc) which causes the customer is bankrupt, being lay-off, jobless so that they cannot pay the instalments to the bank. As noted by Demirgüç-Kunt and Huizinga (2018) addressing the root causes of NPL through comprehensive regulatory and risk management practices is essential for maintaining the financial stability of the banking sector.

(2) Good Corporate Governance (GCG) is guided by Indonesian banking Regulator, where the assessment carried out by the banks based on a self-assessment system.

Table 3. Banks Health Level Based on GCG

Rank	Categories
1	Very Good
2	Good
3	Quite Good
4	Less Good
5	Not Good

(3) Earning will be measured on the Return on Assets (ROA) ratio. The ROA is expressed in %, calculated and categorized as follow:

$$ROA = \frac{\text{Profit Before Tax}}{\text{Average Total Assets}} \times 100\%$$

Table 4. Formulation and Soundness Level of ROA

Categories	Condition
Very Healthy	ROA > 1.5%
Healthy	1.25% < ROA ≤ 1.5%
Less Healthy	0.5% < ROA ≤ 1.25%
Unhealthy	0% < ROA ≤ 0.5%
Very Unhealthy	ROA ≤ 0%

(4) Capital factor assessment is measured using the Capital Adequacy Ratio (CAR).

$$CAR = \frac{\text{Bank's Capital}}{\text{Bank's Risk Weighted Assets}} \times 100\%$$

Table 5. Formulation and Health Level of CAR

Categories	Condition
Very Healthy	CAR > 12%
Healthy	9% ≤ CAR < 12%
Less Healthy	8% ≤ CAR < 9%
Unhealthy	6% < CAR < 8%
Very Unhealthy	CAR ≤ 6%

B. Strategies to Prevent Mortgage Loans from Becoming Foreclosed Assets

Preventing mortgage foreclosures requires a comprehensive approach that combines strategic management, financial intermediation, and an understanding of default and foreclosure dynamics. Strategies must address both the financial and behavioral aspects of customers, to be effective. The strategies that can be implemented were divided into 2 characteristics:

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1. Corrective Characteristic: actions taken to correct the root cause of a problem or event to prevent its recurrence. The examples are (a) Loan Modification Programs, which modify mortgage terms to make payments more affordable for customers facing financial hardship, and (b) Payment Deferment Agreements, where temporarily suspend or reduce mortgage payments for customers facing short-term financial crises. Crisis management theory supports temporary relief measures during times of economic distress. The example of this strategy is COVID-19 Mortgage Deferment Programs.
2. Preventive Characteristic: proactive measures taken to identify and eliminate potential sources of problems before they occur. The examples are (a) Financial Counseling/Education for customers through financial literacy resources to help them manage their finances and understand their mortgage options, and (b) Credit Insurance (Mortgage Protection Insurance) by providing insurance policies that cover mortgage payments in the event of unforeseen circumstances such as job loss, disability, or bankrupt.

Risk management theory supports the use of insurance to mitigate the financial impact of adverse events on customers and banks. Credit insurance is a risk management tool designed to reduce the financial risk for both lenders and borrowers (Doherty, 2000; Harrington & Niehaus, 2003). Credit insurance protects borrowers by ensuring that mortgage payments are covered during times of financial hardship, reducing the likelihood of default and foreclosure. It provides a safety net that can stabilize the borrower's financial situation and provide time to recover from adverse events (Doherty, 2000; Harrington & Niehaus, 2003).

C. Fishbone Diagram, Multi-Criteria Decision Making (MCDM) and Analytic Hierarchy Process (AHP)

Based on the problem situation faced by the Bank, the author took an initiative to identify and make a listing of the causes into categories by using fishbone diagram or what is known as Ishikawa diagram. Detecting problems in the company's business processes is very important to quickly overcome the main problems that the company has during its business processes. The fishbone diagram analysis can highlight the root causes of the increase in foreclosed assets that originating from mortgage loans and what made the mortgage loans becoming foreclosed assets. Using the fishbone diagram could help the company's decision maker in identifying various root cause from the problem, after identifying the root cause, the company's decision maker will sort every factor of the root cause before making the decision, which in the end is conical into prioritizing adequate strategies to implement in solving the problem. In various fields, decision-makers must systematically address problems by considering multiple factors, such as necessity and favorable strategies availability, before making up a good choice to implement in solving the problem. According to Zhu et al. (2021), MCDM involves evaluating a situation based on various criteria to select the best available solution or options. *Typically, the MCDM process is divided into three major steps: identifying and selecting criteria, determining the weights of each criterion and alternative, and ranking the criteria and alternatives using an MCDM method* (Taherdoost & Madanchian, 2023). MCDM framework offers several benefits for its users, including, it provides systematic and structured framework for decision making, could accommodate and integrate multiple objectives and criteria, capable to handle uncertainty and subjectivity, facilitate inclusion of multiple perspectives from various stakeholders, and can be used in various fields (Sahoo & Goswami, 2023). *The focus of this research is to find favorable strategies in reducing foreclosed assets that originating from mortgage loans and in preventing mortgage loans from becoming foreclosed assets* based on number of keys criteria using a suitable decision-making framework. Considering the research objective, the MCDM framework has been recognized as a suitable and relevant framework to address the Bank's business issues. AHP, developed by Thomas L. Saaty in the 1970s, is a decision-making framework designed to break down complex problems into manageable components, incorporating both quantitative and qualitative factors (Liu et al., 2024). Author has examined some literatures that related to banking, Cecilia & Sudrajad, (2024) conducted a study of risk assessment to identifies and classifies various types of risk, in facilitating the prioritization process, the study used of Saaty's AHP as the method, also another study was conducted by Rudiyanto & Sudrajad (2024), to determine the most suitable sustainability report standard for banking, where the study also using AHP. The AHP method involves organizing decision problems into hierarchies of criteria and sub-criteria, followed by pairwise comparisons to determine their relative importance (Abdullah & Asmael, 2023). This systematic approach facilitates prioritization and evaluation of alternatives based on predefined criteria. AHP consists of 7 sequential steps (adapted from Shanmugasundaram & Chidhembaram, 2024): (1) Define the decision problem, (2) Creating hierarchy structure, (3) Formation of pair wise matrix to calculate criteria weight, (4) Determine the criteria weight and weighted sum value, (5) Determine the consistency index (CI) and consistency ratio (CR), (6) Formation of pair wise matrix to calculate each alternative criterion weight, and (7) Formation of decision matrix and assign the rank based on priority.

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CONCEPTUAL FRAMEWORK

This research's conceptual framework is based on Four Basic Rationale Process from Kepner-Tregoe Approach, a systematic model for decision-making. It includes four key components: (i) Situation Analysis (SA) will be used to understand and identify business problem of the company, (ii) Problem Analysis (PA) will identify root cause of the problem using a fishbone diagram, (iii) Decision Analysis (DA) will explore the actions to be taken based on a structured decision-making process. Given the focus of this research to develop strategies in reducing foreclosed assets that originating from mortgage loans and in preventing mortgage loans from becoming foreclosed assets, the decision-maker will examine the purpose of the decision, identify available options, and recognize the risks of each alternative. Using factors identified in the fishbone analysis, the AHP model will help identify alternative courses of action, determine relevant criteria, assign values to measure the performance of alternatives, weigh each criterion, take a weighted average, make a provisional decision, and perform a sensitivity analysis to test the robustness of the decision (Goodwin et al., 2024:30-31), and (iv) Potential Problem Analysis (PPA) will anticipate future challenges and mitigate potential negative consequences.

DATA COLLECTION METHOD

Mazhar (2021) described data collection as the process of gathering and examining data using a specific method. The objective of the data collection process is to ensure the data used in the research are sufficient, suitable, and measurable to perform the data analysis process and achieve the research objectives (Syed & Qadri, 2021). Data collection methods are divided into primary and secondary categories (Taherdoost, 2021). This research utilized primary and secondary data collection methods in a quantitative and qualitative way to enrich and complete the information needed for analysis as follow:

(i) Primary Data from FGD - to collect and summarized the respondent insights about the relevant criteria and sub criteria to be used in this research and establish a quantitative threshold for each criterion and sub criteria relatively to each available alternative.
(ii) Primary Data from Questionnaire - to define relative importance between each criterion or sub criteria used in this research based on the respondent knowledge and perspective using a pairwise comparison table that utilizes the Saaty's scale for quantifying the respondent judgements. The questionnaire is developed using an AHP worksheet templates from https://bpmsg.com.
(iii) Secondary Data - author needs historical data from internal Bank, which can be derived from Bank's published report, also data from Regulator's report, research of literature, and web page to find related information.
(iv) SWOT Analysis to evaluate internal and external factors for considering both positive and negative aspects (Nazarko et al., 2017).

DATA ANALYSIS METHOD

By using mixed method data analysis, author tried to identify the important root cause of Bank's business issue and propose a feasible initiative to mitigate root cause. For qualitative data collection, author is pay attention to author's best knowledge in summarize FGD result and try to get more close information as intended by participants of FGD. For quantitative data collection, author provide carefully about source of information, it should come from proven sources. Content analysis was selected as methodology to convert well-organized data. Guidelines for content analysis were applied in examining the data, which aiming to define and quantify specific business issue. In addition, author using the analytical tools, where FGD was also conducted to determine the weights of each criterion contained in the AHP hierarchy. During FGD, the author gathers information related to weighting of criteria. From FGD results, it can also decide which alternatives are suitable for Bank. Weighting processing is conducted using AHP calculator online. Subsequently, author conducting deepen analysis to define a conclusion for Bank's business issue with the objective to deliver recommendation of strategies of reducing the amount of foreclosed assets that originating from mortgage loans and preventing mortgage loans from becoming foreclosed assets within the Bank.

RESULTS AND DISCUSSION

A. In review the financial health of the Bank during increasing its foreclosed assets, a RBBR analysis was applied by using ratios NPL, CAR, and ROA, to link the relationship between such ratios with foreclosed assets.

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Table 6. NPL, CAR and ROA of the Bank Compare With Indonesia Banking Industry and Regulation

Description	2019	2020	2021	2022	2023	2023 Category
NPL of the Bank	1.7%	1.9%	2.4%	2.4%	1.6%	Very Healthy
NPL of Indonesia Banking Industry	2.5%	3.1%	3.0%	2.4%	2.2%	Healthy
Based on Regulation Soundness of NPL	Maximum 5%					
ROA of the Bank	2.2%	1.5%	1.6%	1.9%	2.1%	Very Healthy
ROA of Indonesia Banking Industry	2.5%	1.6%	1.8%	2.4%	2.7%	
Based on Regulation Soundness of ROA	Minimum 0.5%					
CAR of the Bank	19.2%	22.0%	23.1%	21.5%	23.7%	Very Healthy
CAR of Indonesia Banking Industry	23.4%	23.9%	25.7%	25.7%	27.7%	
Based on Regulation Soundness of CAR	Minimum 8%					
GCG Self-Assessment Composite Rank	1	1	1	1	1	Very Healthy

According to the RBBR analysis and shown in Table 6. NPL, CAR and ROA of the Bank Compare With, Indonesia Banking Industry and Regulation, the increase in foreclosed assets suggests heightened uncovered credit risk, but with NPL remaining low, its impact on Bank's asset quality remains manageable. During 2019–2023, the Bank demonstrated strong financial health based on its NPL, GCG Self-Assessment, CAR, and ROA, despite the increase in foreclosed assets. Therefore, Bank remains in a healthy condition.

B. Identify & Determine Root Cause and (Highest-Lowest Priority) Using Pareto Chart

According to Coccia (2020), the Ishikawa diagram is a way to help in solving problems by mapping all possible causes of a problem, systematically and visually to identify the main root causes. The author chosen to use a fishbone diagram because thus diagram can focus on solving the root causes of the problem rather than mitigating the symptoms, thus ensuring that the implemented solution will be right on target. The Fishbone diagram, including its categories, causes, and sub-causes, was developed through the author's analysis and discussions with experienced members of the foreclosed assets and mortgage lending teams as well as customers, who directly understand and face the problem relating to mortgage loans and foreclosed assets, shown in Table 7. Fishbone Causes Scoring Result.

Table 7. Fishbone Causes Scoring Result

Root Causes High Outstanding of Foreclosed Assets that Originating from Mortgage Loans		Score	% Contribution
A	Customers can't compete with competitors, which resulted to customer's business is bankrupt.	64	8%
B	Customers impacted by crisis/COVID19.	63	8%
C	Customers get layoff/jobless.	62	7%
D	Customers high-cost living, don't have personal back up fund to cover his/her mortgage loan.	66	8%
E	Employee's inappropriate assessment on customer application	48	6%

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F	Employee's target oriented by sometimes obtaining incomplete customer's real data	**48**	**6%**
G	Bank's inaccurate in determining selling price of foreclosed assets, resulted to slow progress of selling foreclosed assets.	**49**	**6%**
H	Bank's less cooperation with property agent/brokerage, resulted to slow progress of selling foreclosed assets.	**75**	**9%**
I	Bank's inadequate maintenance of its foreclosed assets, resulted to bad physical foreclosed assets are not interesting for buyer.	**72**	**9%**
J	Bank's infrequent SOP review.	**49**	**6%**
K	Lack of new strategy in SOP to protect Bank's mortgage loans.	**49**	**6%**
L	Lack of employee to monitor periodically on the compliance of mortgage loans process.	**49**	**6%**
M	Impacted on unfavorable global or local economy condition	**65**	**8%**
N	Insufficient insurance protection on the customer's mortgage loan (only cover life and property insurance).	**81**	**10%**

Pareto analysis is a statistical decision-making strategy that places a high priority on selecting a few activities that produce the most significant outcomes. According to Kumar et al. (2019), concentrating on the most significant causes can assist in maximizing an effort's productivity and effectiveness. Using FGD and Pareto analysis together, this research employs a data-driven approach. The significance of each factor that leads to causing the increase of foreclosed assets is compared using a quantitative assessment technique in the FGD. The information was analyzed using the Pareto analysis approach to identify the vital few causes that significantly impact the main issue. Causes on the left of the line, where it crosses the 80% threshold, are categorized as the vital few.

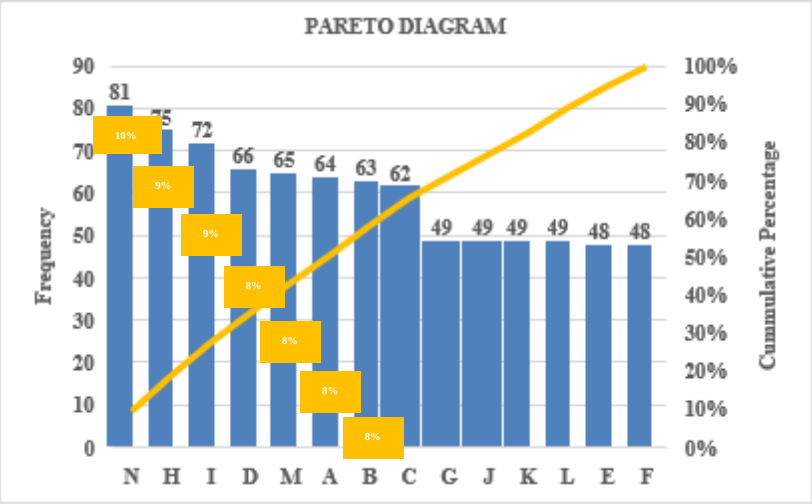

Figure 1. Bank's Pareto Diagram

In accordance with Pareto diagram shown in Figure 1. Bank's Pareto Diagram, two vital few causes can influence the overall problem of increasing foreclosed assets in Bank, namely: Insufficient insurance protection on the customer's mortgage loans (only cover life and property insurance) and Bank's less cooperation with property agent, that resulting to slow progress of selling foreclosed assets to be analyzed and resolved in this research. Furthermore, author will propose alternative strategies in reducing high outstanding of foreclosed assets that originating from mortgage loans as well as preventing mortgage loans from becoming foreclosed assets by considering the two vital few causes as mentioned.

C. List of Alternative Strategies

In mortgage financing, banks provide protection to customers through two main types of insurance, as follows: (1) life insurance, to protect customers if there is a risk of death before the mortgage repayment period is complete, and (2) property insurance, to protect the financed property from the risk of fire or other major damage. Along with economic changes and uncertainty in the world of work and businesses, the need for more comprehensive mortgage insurance has emerged, in the following situations:

1. Loss of Income: If customers experience a significant decrease in income, this insurance can take over the payment of mortgage instalments for a certain period, so the customer won't threatened with default due to sudden changes in financial conditions.
2. Layoffs are a real risk amidst fluctuating economic conditions. With mortgage insurance that covers layoffs, customers who lose jobs can feel calmer because mortgage instalments will continue to be paid during the transition period of looking for a new job.

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3. Customers who experience an accident or are permanently disabled and can no longer work, need additional protection. In this situation, mortgage insurance will ensure that the remain mortgage instalments paid fully or within the agreed period.

According to Regulator data, in 2023, the NPL level for mortgages is 2.4%. This shows that there are customers experiencing difficulties in paying their mortgage instalments. The banking industry in Indonesia also noted about the increase in credit risk in the housing sector during the pandemic period, where many customers experienced a decrease in income or lost their jobs. Additional insurance for the risk of loss of income can reduce the risk of mortgage default, this reflects the need to expand mortgage insurance coverage to deal with various situations that can disrupt the customer's ability to fulfil their financial obligations.

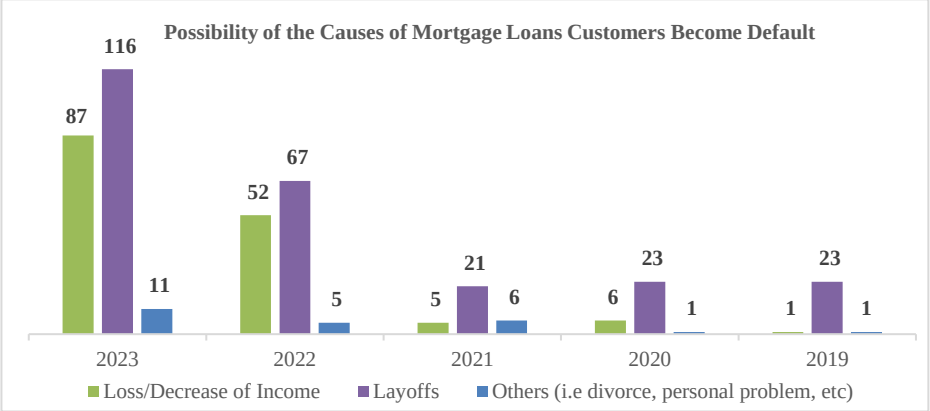

Figure 2. Possibility of the Causes of Mortgage Loans Customer Become Default

According to the Bank's internal data, as shown in Figure 2. Possibility of the Causes of Mortgage Loans Customers Become Default, the causes were due to loss of income with a total of 87 units which are the customers who work as entrepreneurs, while due to layoffs with a total of 116 units which are the customers who work as employees and due to other reasons as many as 11 units who are the customers that experiencing internal or personal problems.

In dealing with the problems above, collaborative efforts are needed between banks and insurance companies to create mortgage insurance products that provide innovative and comprehensive protection, which not only provides protection for the payment of mortgage instalments when customer dies through life insurance or protection for property when fire/natural disaster occurs, but can also provide protection for customer's financial well-being when they experience a loss of income, layoff or accident. With additional protection, for a certain agreed period, customers can have opportunity to pay greater attention to overcoming the disaster they are experiencing and can recover as quickly as possible to get a new source of income without being burdened with mortgage instalment obligations that need to be paid. Meanwhile, from the bank's perspective, mortgage loans remain a productive asset and banks can also help or provide support to customers so they can immediately have a new source of income. With the explanation above, to support the Bank in reducing the risk of foreclosed assets that originating from mortgage loans, the author proposes that the Bank add alternative strategy 1 - Protection Insurance for Customer's Mortgage Loans. *This strategy is proposing to be conduct by the Bank with the objective to diminish the first of the vital few causes and this is a Preventive Characteristic strategy in impeding to reduce the possibility of mortgage loans from becoming foreclosed assets, and at the end will make the outstanding of foreclosed assets that originating from mortgage loans become lesser or minimum in a manageable level.*

Currently, banking in Indonesia is facing challenges with the high number of foreclosed assets, especially those originating from mortgage loans, which indicates bank's inability to sell the property caused by lack of collaboration with experienced property agents.

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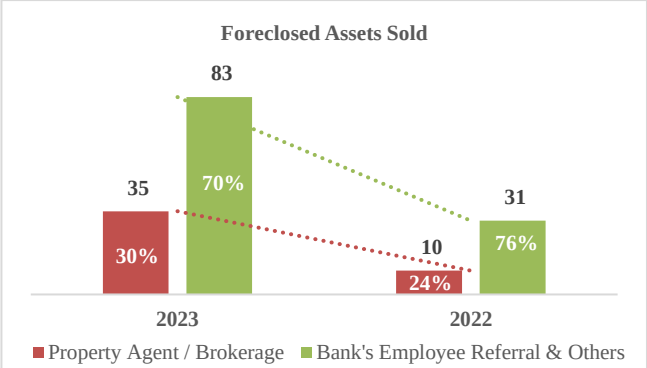

Figure 3. Foreclosed Assets Sold

Table 8. Total Property Agent

Property Agent / Brokerage	2023	2022	YoY
Independent	10	2	400%
Non-Independent	5	4	25%
Total	**15**	**6**	**150%**

According to Bank's internal data, as shown in Figure 3. Foreclosed Assets Sold, the number of Bank's foreclosed assets sold through property agents is only covers around 30% of the total Bank's foreclosed assets sold. This fact shows that there is a big opportunity that has not been exploited by Bank in establishing strategic partnerships with property agents to reduce the high number of foreclosed assets.

Figure 3. Foreclosed Assets Sold, shown that 35 units sold through Property Agents and from that amount, the 12 units came from 10 independent property agents (not related to any official brokerage), while 23 units came from 5 official brokerages with brokerage brand name office. The high foreclosed assets figures for mortgages in Indonesian banks currently reflect a lack of optimization in the handling of confiscated property. To face this challenge, Bank needs to be more proactive in collaborating with property agents, who have capacity to speed up sales process and reduce Bank's foreclosed assets. *Author proposes to Bank to alternative strategy 2 - Actively Partnering with property agents to accelerate sale of foreclosed assets as-is and alternative strategy 3 - Collaborating with property agents to renovate foreclosed assets. The strategies are proposing with objective to diminish the second of vital few causes and it's a Corrective Characteristic strategy to reduce foreclosed assets originating from mortgage loans.*

D. Establishment of Criteria and Sub Criteria

To enrich the formulation of criteria and sub criteria, a SWOT analysis has been conducted to breakdown internal and external factors that could contributing and affecting the strategies selection within the Bank in solving the two vital few causes mentioned earlier.

Table 9. Preliminary Criteria

Criteria	Description
Timeliness	Speed of time strategy can be implemented
Risk Management	Potential risks & uncertainties
Legal & Compliance	Compliance with regulations.
Financial	Elaboration of cost estimation and potential financial benefit.
Sustainability	Potential innovation for new product as well as collaboration.
Social & Environment	Impact on the environment and social responsibility.
Organizational	Alignment with the Bank's objective.

Findings from SWOT analysis provide valuable references for developing a comprehensive strategies selection. By integrating the insights into decision-making processes, Bank can prioritize strategies that align with its objective. Results of SWOT analysis and FGD are the guidance for author to identify relevant criteria and sub criteria which will be used in the following process of this research. Secondary data collection also conducted to get insights and benchmark from previous literatures that might have a similar kind of problems. There are seven types of criteria commonly used as a guidance for assessing the proposed strategies: Timeliness, Risk Management, Legal & Compliance, Financial, Sustainability, Social & Environment, and Organizational. Each criteria have different factors to be assessed in decision-making process as shown in Table 9. Preliminary Criteria.

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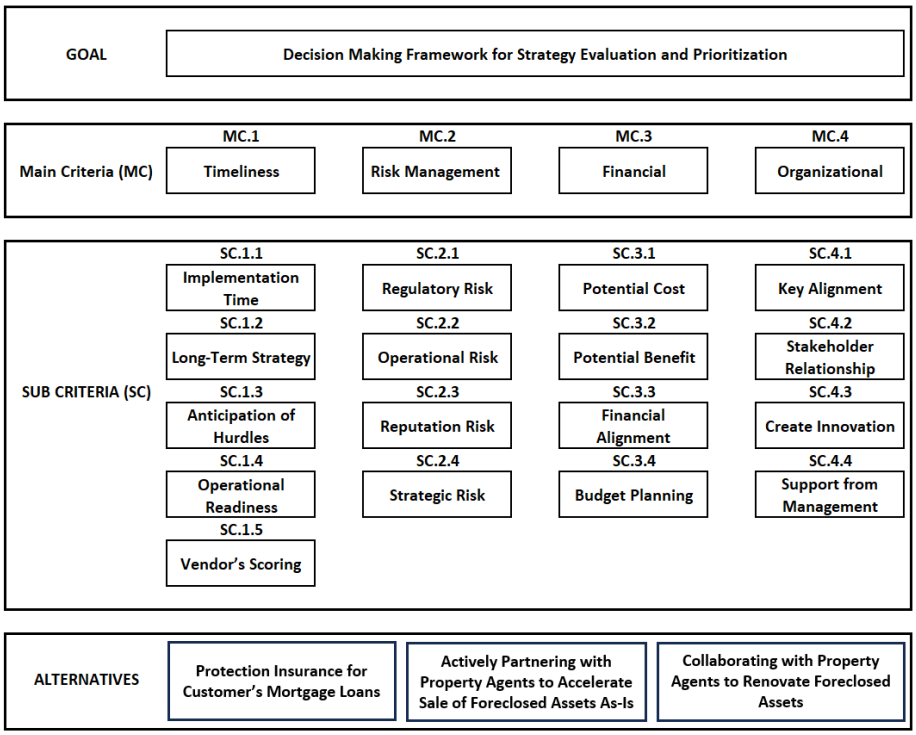

Figure 4. AHP Hierarchical Structure

Preliminary criteria were reviewed in FGD by participants as main stakeholder to all three alternative strategies proposed in determine relevancy of each criterion to be used in final AHP model. Based on FGD, 4 out of 7 criteria are agreed as factors to evaluate alternatives which are Timeliness, Risk Management, Financial and Organizational. After that, FGD is expanded by establishing sub criteria list based on stakeholder's perspectives by considering importance, practicality, and relevancy of sub criteria to the proposed alternative strategies. Continuing analysis process of AHP model, a hierarchical structure needs to be developed using goals, alternatives, criteria, and sub criteria. The AHP hierarchical structure of this research is divided into four level as depicted in Figure 4. AHP Hierarchical Structure. The structure briefly illustrates the relationship between each element which facilitate the author to explain the complex AHP structure and the establishment of pairwise comparisons to the decision makers more easily.

E. Pairwise Comparison Matrix and Criteria

Pairwise Comparison Matrix questionnaire is distributed to all selected stakeholders, covering of Main Criteria and Sub Criteria of Timeliness, Risk Management, Financial, and Organizational. Respondents need to choose criteria or sub criteria according to their knowledge and define relevance significance between them. Knowledge and expertise of each respondents have a pivotal role during questionnaire completion process and the answer of each participant could be diverse based on their actual and relevant experience.

Table 9. Stakeholder Weight

No.	Participants Function	Position	Experienced	Weight
1	Mortgage Loans Unit	Secured Loan Customer Solutions Division Head	14 years	3
2		Secured Loan Product Management Head	13 years	2
3		Secured Loan Policy and Process Improvement	9 years	1
4	Foreclosed Assets Management	Corporate Development - Head	12 Years	3
5		Corporate Development Specialist	14 years	2
6		Corporate Development Specialist	2 years	1

Each stakeholder's answer is weighted differently due to consideration of their diversity of knowledge, experience, and competency, as shown in Table 9. Stakeholder Weight

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F. Criteria, Sub Criteria Weight Calculation and Pairwise Comparison Matrices Consistency Check

All the pairwise comparison matrix is being consolidated and aggregated using geometric mean based on their respective hierarchical group and each participant's evaluation weight. The matrices of main criteria and sub criteria need to be normalized by conducting three steps: (1) calculate the sum of each column; (2) divide each element in the cells by their corresponding column sum and the total value of each column must be equal to 1; and (3) sum and average the values of each element within the same row. In addition, a consistency check help to validate the judgements from the respondents is coherent and reliable. It can be utilized as a feedback mechanism to recheck then repeat the questionnaire mechanism if the result is higher than the determined threshold and it also valuable to establish a comparative evaluation that compile different sets of judgement from diverse respondents. The computation sequence of consistency check process: (1) calculate λ Max using priority vectors matrix by multiplying each cell value to corresponding criteria weights in the same row, sum the total value for each row, divide total value using the corresponding criteria weights, and averaging the final value to generate λ Max, (2) calculate Consistency Index (CI) by subtracting λ Max with number of columns in the matrix and dividing it with (n-1), (3) define Random Consistency Index (RI) based on table according to number of criteria, and (4) calculate Consistency Ratio (CR) by dividing CI with RI.

Table 10. Consistency Check

Description		Weighted Sum Value	Weights	Eigen Value	λ Max	n	CI (λ Max - n) / (n-1)	RI	CR (CI / RI)	Status
Main Criteria	MC.1	1.597	0.393	4.063	4.042	4	0.0139	0.9	0.015	Consistent
	MC.2	1.726	0.424	4.070						
	MC.3	0.464	0.115	4.025						
	MC.4	0.272	0.068	4.008						
Timeliness Sub Criteria	SC.1.1	1.922	0.363	5.294	5.168	5	0.042	1.12	0.038	Consistent
	SC.1.2	1.968	0.369	5.339						
	SC.1.3	0.551	0.108	5.108						
	SC.1.4	0.616	0.122	5.045						
	SC.1.5	0.194	0.038	5.057						
Risk Management Sub Criteria	SC.2.1	1.702	0.419	4.066	4.044	4	0.015	0.9	0.016	Consistent
	SC.2.2	1.393	0.344	4.053						
	SC.2.3	0.446	0.111	4.029						
	SC.2.4	0.511	0.127	4.026						
Financial Sub Citeria	SC.3.1	0.952	0.236	4.035	4.030	4	0.010	0.9	0.011	Consistent
	SC.3.2	1.737	0.430	4.041						
	SC.3.3	0.849	0.211	4.032						
	SC.3.4	0.496	0.124	4.010						
Organizational Sub Criteria	SC.4.1	1.605	0.399	4.018	4.012	4	0.004	0.9	0.005	Consistent
	SC.4.2	0.935	0.233	4.013						
	SC.4.3	1.009	0.252	4.012						
	SC.4.4	0.464	0.116	4.006						

Consistency check process is performed to five matrices, which are main criteria, sub criteria matrices of timeliness, risk management, financial, and organizational. The respective CR values are 0.015, 0.038, 0.016, 0.011, and 0.005. Since all CR is < 0.1, it proves that all consolidated pairwise comparison matrix along with the related findings are consistent and can be utilized in the following process.

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G. Global Weights Calculation

To create a prioritization for the strategies, a calculation to define the global weight of each sub criteria is needed. The calculation is performed by multiplying the local priority weight of each sub criteria to their respective main criteria's weight. The global weight itself representing the overall importance of each sub criteria compared to other factors from all criteria used in the AHP methodology. The result of the calculation itself is shown in Table 11. Calculation of Global Weight.

Table 11. Calculation of Global Weight

Criteria	Criteria Weight	Sub Criteria	Local Weight	Global Weight
MC1	39.3%	Implementation Time	36.3%	14.3%
		Long-Term Strategy	36.9%	14.5%
		Possibility of Hurdles	10.8%	4.2%
		Operational Readiness	12.2%	4.8%
		Vendor's Scoring	3.8%	1.5%
MC2	42.4%	Regulatory Risk	41.9%	17.8%
		Operational Risk	34.4%	14.6%
		Reputation Risk	11.1%	4.7%
		Strategic Risk	12.7%	5.4%
MC3	11.5%	Potential Cost	23.6%	2.7%
		Potential Benefit	43.0%	5.0%
		Financial Alignment	21.1%	2.4%
		Budget Planning	12.4%	1.4%
MC4	6.8%	Key Alignment	39.9%	2.7%
		Stakeholder Relationship	23.3%	1.6%
		Create Innovation	25.2%	1.7%
		Support from Management	11.6%	0.8%

The calculation results show the varieties of prioritization weight of each component with regulatory risk is the most critical sub criteria which represents 17.8% of the total weight. It explains that in implementing a strategy, respondents put more focus on regulatory activities as well as mitigating its risk. The five prioritize of the influenced sub criteria after regulatory risk, are operational risk (14.6%); long-term strategy (14.5%); implementation time (14.3%); strategic risk (5.4%) and potential benefit (5.0%), for those sub criteria and the other were provide further insight into their relative importance and impact on the overall strategy prioritization and decision-making process.

H. Scoring Calculation of Alternatives

After global weights of each sub criteria have been determined, the scores of each alternative under those criteria are needed to be defined to calculate total score of each alternative. To define these scores, a set of quantitative thresholds has been established for every sub criterion during FGD process which every set is divided to 4 different levels ranges from 25 to 100 with each level increasing by 25 points, which are beneficial to systematically quantifying performance of each alternative to ensure a clear and measurable method to differentiate the options based on their respective merits. Following the establishment of each sub criteria score for every alternative, it needs to be normalized to ensuring fair and accurate comparison across different sub criteria and alternatives. To normalize the score, all the scores in each sub criteria for all alternatives are summed up to get the total score for every sub criterion. After that, each score is divided into their respective sub criterion total value to obtain the standardized score as a percentage. The calculation results are shown in Table 12. Normalization of Alternatives Scores.

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Table 12. Normalization of Alternatives Scores

Sub Criteria	Score			Total	Normalized		
	Alternative 1	Alternative 2	Alternative 3		Alternative 1	Alternative 2	Alternative 3
Implementation Time	50	75	25	150	33%	50%	17%
Long-Term Strategy	75	75	75	225	33%	33%	33%
Possibility of Hurdles	75	75	75	225	33%	33%	33%
Operational Readiness	100	50	50	200	50%	25%	25%
Vendor's Scoring	100	75	75	250	40%	30%	30%
Regulatory Risk	100	100	100	300	33%	33%	33%
Operational Risk	100	100	100	300	33%	33%	33%
Reputation Risk	100	100	100	300	33%	33%	33%
Strategic Risk	100	100	100	300	33%	33%	33%
Potential Cost	75	50	50	175	43%	29%	29%
Potential Benefit	100	75	75	250	40%	30%	30%
Financial Alignment	100	75	75	250	40%	30%	30%
Budget Planning	100	100	50	250	40%	40%	20%
Key Alignment	100	100	100	300	33%	33%	33%
Stakeholder Relationship	100	100	75	275	36%	36%	27%
Create Innovation	100	100	100	300	33%	33%	33%
Support from Management	100	50	50	200	50%	25%	25%

The final step of this AHP process is to determine the final weight of each alternative by multiplying the global weight of each sub criterion to its respective normalized value, this calculation is performed to all the available alternatives. The calculation results will be the baseline to create the decision matrix and the results are displayed in Table 13. Result of Alternative Scoring Calculation.

Table 13. Result of Criteria Scoring Calculation

Criteria	Sub Criteria	Normalized Alternative			Global Weight	Sub Criteria Alternative			Criteria Alternative		
		1	2	3		1	2	3	1	2	3
Timeliness	Implementation Time	33 %	50 %	17 %	14%	4.76 %	7.14 %	2.38 %	14.00%	15.03%	10.27%
	Long-Term Strategy	33 %	33 %	33 %	14%	4.83 %	4.83 %	4.83 %			
	Possibility of Hurdles	33 %	33 %	33 %	4%	1.41 %	1.41 %	1.41 %			
	Operational Readiness	50 %	25 %	25 %	5%	2.40 %	1.20 %	1.20 %			
	Vendor's Scoring	40 %	30 %	30 %	2%	0.60 %	0.45 %	0.45 %			
Risk Management	Regulatory Risk	33 %	33 %	33 %	18%	5.92 %	5.92 %	5.92 %	14.13%	14.13%	14.13%
	Operational Risk	33 %	33 %	33 %	15%	4.86 %	4.86 %	4.86 %			
	Reputation Risk	33 %	33 %	33 %	5%	1.57 %	1.57 %	1.57 %			

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	Strategic Risk	33 %	33 %	33 %	5%	1.79 %	1.79 %	1.79 %			
Financial	Potential Cost	43 %	29 %	29 %	3%	1.17 %	0.78 %	0.78 %	4.69%	3.56%	3.28%
	Potential Benefit	40 %	30 %	30 %	5%	1.98 %	1.49 %	1.49 %			
	Financial Alignment	40 %	30 %	30 %	2%	0.97 %	0.73 %	0.73 %			
	Budget Planning	40 %	40 %	20 %	1%	0.57 %	0.57 %	0.29 %			
Organizational	Key Alignment	33 %	33 %	33 %	3%	0.90 %	0.90 %	0.90 %	2.44%	2.24%	2.10%
	Stakeholder Relationship	36 %	36 %	27 %	2%	0.57 %	0.57 %	0.43 %			
	Create Innovation	33 %	33 %	33 %	2%	0.57 %	0.57 %	0.57 %			
	Support from Management	50 %	25 %	25 %	1%	0.39 %	0.20 %	0.20 %			
						Total			**35.26 %**	**34.96 %**	**29.78 %**

BUSINESS SOLUTION

The business solution for this research is synthesized from the findings and outcomes of the analysis process in the previous section. The product of the process is a strategy prioritization proposal, which is defined based on the combined weight of each strategy, as illustrated in Table 14. Result of Alternative Scoring Calculation. The figure reveals that Alternative 1 – Protection for Customer's Mortgage Loans as the most viable strategy to be prioritized, holding 35.26% of the total weight. It holds the highest weight score for sub criteria risk management, financial, and organizational with 14.13%, 4.69%, and 2.44% respectively, while in term of timeliness, it is not quite fast as there is a need of time, up to 6 months in making a relevant product as well as get approval from related regulator. Alternative 1 show that it has a potential in preventing mortgage loans from becoming foreclosed assets. In addition, Alternative 2 is ranked second with 34.96% of the total weight, the insignificant point difference between these two alternatives outlines that both of strategy is important to be executed and prioritized. In conclusion, the findings proposed the Bank to prioritize Alternative 1 as the first strategy, followed by Alternative 2 as the second strategy to implement and Alternative 3 as a compliment strategy.

Table 14. Result of Alternative Scoring Calculation

Criteria / Alternative	Protection Insurance for Customer's Mortgage Loans	Actively Partnering with Property Agents to Accelerate Sale of Foreclosed Assets As-Is	Collaborating with Property Agents to Renovate Foreclosed Assets
Timeliness Criteria	14.00%	15.03%	10.27%
Risk Management Criteria	14.13%	14.13%	14.13%
Financial Criteria	4.69%	3.56%	3.28%
Organizational Criteria	2.44%	2.24%	2.10%
Total Weight	**35.26%**	**34.96%**	**29.78%**
Rank	**1**	**2**	**3**

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