



Risk Awareness and Management Culture in Supporting Sustainable Banking Operations

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ABSTRACT

The growing demand for sustainable banking operations requires strong internal risk governance as a foundation for long-term sustainability. This study analyzes the influence of risk awareness and risk management culture on sustainable banking operations in conventional commercial banks. Using a quantitative explanatory approach, data were collected through structured questionnaires distributed to 80 employees of conventional commercial banks in Palembang and analyzed using multiple linear regression. The results indicate that risk awareness has a positive and significant effect on sustainable banking operations, while risk management culture exerts a stronger and more consistent influence. Simultaneously, both variables significantly support banking sustainability. These findings confirm that sustainable banking is shaped not only by regulatory compliance but also by the internalization of risk management values, behaviors, and culture within organizations. This study contributes to the banking risk management literature and provides practical insights for bank managers in developing sustainability strategies through the strengthening of risk culture.

INTRODUCTION

In the past decade, sustainable banking has evolved to be at the top of the agenda in the global financial system, as systemic risks, economic volatility, and governance demands become increasingly complex. Banks are no longer judged solely on short-term financial performance, but also on the institution's ability to manage risks in an integrated manner to maintain long-term operational sustainability. Borio (2021) emphasized that weak internal risk management is one of the main factors that exacerbate the vulnerability of the banking sector to crises. Therefore, risk awareness is a fundamental element in ensuring the stability and sustainability of financial institutions.

Along with these developments, academic and practical attention is increasingly focused on the role of risk management culture as an internal mechanism of organizational control. An organizational culture that emphasizes risk awareness allows individuals within the bank to proactively identify and respond to risks in their day-to-day operational activities. Beck et al. (2022) show that banking failures are often rooted in the weak internalization of risk management values, not in the absence of formal regulation. Thus, risk awareness and risk management culture function as crucial non-technical determinants in supporting sustainable banking operations.

In the context of developing countries, the challenges of implementing sustainable banking have become more complex due to limited institutional capacity and changing regulatory dynamics. Khan et al. (2021) emphasized that banks in developing countries face the dual pressure between compliance demands and the need to maintain operational efficiency. At the regional level, banks are often faced with limited human resources and variations in the quality of internal governance. This condition requires strengthening risk awareness and risk management culture so that sustainability practices do not stop at the formal policy level.

Although studies on risk management and banking sustainability are evolving, most of the previous research has focused on structural aspects, such as prudential regulation, internal control frameworks, and quantitative model-based risk measurement. Research by Laeven and Valencia (2020) shows that structural approaches alone are not enough to explain differences in sustainability performance between banks. Relatively few studies have empirically examined behavioral dimensions, specifically individual risk awareness and risk management culture, as determinants of operational sustainability. These limitations indicate that there are research gaps that need to be filled through an organizational behavior-based approach.

In Indonesia, empirical research on the relationship between risk awareness, risk management culture, and sustainable banking operations is still dominated by studies on national banks or using secondary data. Regional studies describing the internal conditions of conventional commercial banks at the regional level are still relatively limited. In fact, as stated by Nugroho and Purwanto (2023), regional banks play a strategic role in supporting local economic development and regional financial system stability. This empirical

gap reinforces the urgency of research that examines the internal dynamics of risk management in regional banks in more depth.

Based on this description, this study aims to analyze the influence of risk awareness and risk management culture on sustainable banking operations in conventional commercial banks in Palembang City. This study explicitly examines the partial and simultaneous influence of the two independent variables on the sustainability of banking operations. A quantitative approach with explanatory design is used to obtain measurable and objective empirical evidence. The focus of the analysis is directed at the perception of employees as the main actor in the implementation of risk management at the operational level.

This research is expected to make a theoretical contribution by enriching the banking risk management literature through the integration of risk awareness perspectives and organizational culture within the framework of sustainability. Practically, the findings of this study can be the basis for bank management in designing strategies to strengthen risk culture that is oriented towards operational sustainability. In addition, the results of this research can also be a reference for regulators and stakeholders in formulating policies that encourage the internalization of risk management more effectively. Thus, this research contributes to improving the quality of banking governance, especially at the regional level.

THEORETICAL REVIEW

Risk Awareness in the Context of Banking Operations

Risk awareness refers to an individual's level of understanding of the various types of risks inherent in organizational activities and their implications for institutional performance and sustainability. In the banking sector, risk awareness is not limited to the recognition of financial risks, but also includes operational risks, compliance, reputation, and sustainability. Power (2020) emphasized that financial organizations with a high level of risk awareness tend to be able to anticipate uncertainty more systematically, thereby reducing the potential for unexpected operational disruptions. Risk awareness at the individual level is an important prerequisite for the effectiveness of the overall risk management system.

A number of empirical studies show that risk awareness plays a significant role in shaping the quality of decision-making of banking organizations. Mikes and Kaplan (2021) found that banks with a strong level of risk awareness show a tendency to make more cautious and long-term oriented decisions. Risk awareness allows employees to recognize risk signals early on and adjust operational behaviors according to the institution's sustainability goals. Thus, risk awareness can be understood as the foundation of behavior that supports effective risk management practices in banking operations.

(H1): Risk awareness has a positive effect on the sustainability of conventional commercial bank operations.

Risk Management Culture as an Internal Control Mechanism

A risk management culture is a shared set of values, norms, and practices that shape the way organizations perceive, assess, and manage risk. In contrast to formal policies and written procedures, the culture of risk operates at the level of individual behaviors and attitudes within the organization. Sheedy and Griffin (2021) emphasize that a strong risk management culture creates alignment between the risk policy framework and day-to-day operational practices. This allows organizations to manage risk consistently, not only in normal situations but also in conditions of uncertainty.

Follow-up research shows that a mature risk management culture contributes to improving the stability and operational resilience of banks. Muñoz and Koller (2022) found that banks that successfully internalize the risk culture are able to integrate risk considerations into all business processes, not just formal risk management functions. A strong culture of risk encourages individual and collective accountability, thereby reducing the tendency for opportunistic behavior that can threaten the sustainability of the institution. Thus, the risk management culture serves as a crucial internal control mechanism in the banking sector.

(H2): Risk management culture has a positive effect on the sustainability of conventional commercial bank operations.

Sustainable Banking and Risk Management Integration

Sustainable banking emphasizes the balance between economic performance, social responsibility, and environmental protection in bank operations. Within this framework, risk management plays an important role as a tool for managing long-term risks, including environmental, social, and governance risks. Schoenmaker (2021) stated that banking sustainability can only be achieved if the risk management system is able to accommodate non-financial risks that have an impact on the long-term sustainability of the institution. The integration of risk management and sustainability is a strategic need, not just regulatory compliance.

An empirical study by Busch and Friede (2023) shows that banks that integrate sustainability risk into a risk management system have higher operational resilience than banks that still separate the two aspects. This integration allows banks to respond to changes in the business environment in a more adaptive and sustainable manner. The findings confirm that risk management and sustainable banking are two interrelated and mutually reinforcing concepts in modern banking operational practices.

(H3): Risk management integration has a positive effect on the sustainability of banking operations.

Behavioral Dimensions in Banking Risk Management

In addition to the structural and regulatory framework, the dimensions of individual behavior play an important role in the effectiveness of banking risk management. Aebi et al. (2020) emphasized that failure in risk management often stems from behavioral bias and weak organizational culture, not from the limitations of quantitative risk models. A misperception of risk and low

awareness of individual risks can lead to decision-making that is not in line with the institution's sustainability goals.

Huber and Scheytt (2022) add that the internalization of risk values at the individual level contributes directly to the quality of operational risk control. Employees who have a high risk awareness and work in a strong risk management culture tend to demonstrate more consistent adherence to the precautionary principle. Therefore, a behavior-based approach is important in understanding the relationship between risk management and the sustainability of banking operations.

(H4): The dimension of employee behavior in risk management has a positive effect on the sustainability of bank operations.

The Context of Regional Banks and Research Gaps

Conventional commercial banks at the regional level have different operational characteristics than national-scale banks, especially in terms of resources, organizational structure, and supervisory intensity. Tran and Turkiela (2023) show that regional banks rely more on internal risk management practices than external market mechanisms in maintaining operational stability. However, empirical studies that specifically examine the role of risk awareness and risk management culture on the sustainability of regional banks' operations are still relatively limited.

In Indonesia, research on sustainable banking tends to focus on regulatory policies and aggregate financial performance, with little attention to the internal behavioral dimensions of the organization. This gap demonstrates the need for empirical research that integrates risk awareness perspectives and risk management cultures in the context of regional banking.

(H5): Risk awareness and risk management culture simultaneously have a significant effect on the sustainability of conventional commercial bank operations at the regional level.

METHODOLOGY

Research Type and Design

This study uses a quantitative approach with an explanatory design, which aims to test the causal relationship between independent variables and dependent variables based on a conceptual framework that has been formulated theoretically. The quantitative approach was chosen because it allows for objective testing of hypotheses through numerical measurements and inferential statistical analysis (Neuman, 2021). The explanatory design is used to explain the influence of risk awareness and risk management culture on sustainable banking operations, both partially and simultaneously, based on the perception of employees as the main actor in the implementation of risk management at the operational level.

The study used a cross-sectional design, where data was collected at a specific point in time without variable manipulation. This design is relevant to describe the actual state of risk awareness and risk management culture in

regional banking organizations operating in a dynamic regulatory and risk environment (Bryman, 2021).

Population and Sampling Technique

The study population includes all employees of conventional commercial banks operating in the city of Palembang. The selection of this population is based on the characteristics of conventional commercial banks that have a high level of operational risk exposure and compliance, making it the right context to assess operational sustainability based on internal risk management.

The sampling technique used is non-probability sampling with the purposive sampling method. This method was chosen because not all members of the population have a relevant role in the organization's risk management activities. Respondents' criteria included: (1) permanent employees of conventional commercial banks, (2) having a minimum of one year of employment, and (3) engaging in operational or administrative activities related to risk. Based on these criteria, the study involved 80 respondents, a number considered adequate for multiple linear regression analysis in quantitative research of organization and work behavior (Tabachnick & Fidell, 2021).

Data Collection Techniques and Research Instrument

Data collection was carried out using a structured questionnaire designed to measure respondents' perception of the research variables. The survey method was chosen because it is effective in systematically capturing individual perception data and allows for quantitative data processing on an organizational scale (Fowler, 2020).

The risk awareness measurement instrument was compiled based on indicators of individual understanding of operational, compliance, and sustainability risks developed from modern organizational risk management approaches (Arena et al. 2022). The variable risk management culture is measured through indicators of values, norms, and collective behavior related to risk management which refers to the risk culture framework in the financial services sector (Kleffner et al. 2021). Meanwhile, the operational variables of sustainable banking are measured using indicators of long-term efficiency, sustainable compliance, and operational resilience as stated in the sustainable finance literature (Ziolo et al. 2021). All questionnaire items used a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture proportional variations in respondents' approval rates.

Validity and Reliability Testing

The instrument validity test is carried out through a construct validity test using item-total correlation. A statement item is declared valid if the correlation coefficient value shows statistical significance at a confidence level of 95 percent (Taherdoost, 2021). The reliability test was conducted using Cronbach's Alpha, with a minimum value of 0.70 as an indicator of acceptable internal consistency in social quantitative research (Mallery & George, 2020). Validity and reliability testing is carried out prior to the main analysis to ensure that the research instrument is capable of producing accurate and reliable data.

Research Procedure

The implementation of the research is carried out through systematic stages. The initial stage includes problem identification and hypothesis based on relevant literature review. The next stage is the development of research instruments and limited trials to ensure the clarity of the items. Furthermore, questionnaires were distributed to respondents who met the research criteria. After the data is collected, a process of filtering and data processing is carried out to ensure the completeness and consistency of the answers. The final stage is data analysis and interpretation of research results to draw empirical conclusions.

Data Analysis Technique

Data analysis was carried out using multiple linear regression to test the partial and simultaneous influence of independent variables on dependent variables. Before hypothesis testing, a classical assumption test was carried out which included normality, multicollinearity, and heteroscedasticity tests to ensure the validity of the regression model (Alin, 2022). Partial influence testing was carried out through the t-test, while simultaneous influence testing was carried out through the F-test with a significance level of 5 percent. All statistical analysis was carried out using the Statistical Package for the Social Sciences software version 26, which is widely used in quantitative research in the fields of management and finance due to its accuracy and ease of interpretation (Pallant, 2020).

RESEARCH RESULTS

Descriptive Profile of Research Variables

The initial analysis of this study was carried out to illustrate the tendency of respondents' perception of risk awareness variables, risk management culture, and sustainable banking operations. Descriptive statistics were used to assess the mean and variation of respondents' answers, thus providing an initial overview of the internal conditions of risk management in conventional commercial banks in Palembang City.

Table 1. Descriptive Statistics of Research Variables

Variable	N	Minimum	Maximum	Mean	Hours of deviation
Risk Awareness	80	3.10	4.85	4.12	0.41
Risk Management Culture	80	3.25	4.90	4.28	0.38
Sustainable Banking Operations	80	3.05	4.80	4.05	0.44

Table 1 shows that all variables have a mean value above 4.00, which indicates that respondents' perceptions are in the high category. Variable **risk management culture** has the highest average value (Mean = 4.28), reflecting the strong internalization of value and risk management norms in banking organizations. Meanwhile, **risk awareness** It also shows a relatively high rate,

indicating that employees have a good understanding of operational and sustainability risks. This condition provides a strong empirical basis for testing causal relationships between variables.

Partial Effect of Risk Awareness on Sustainable Banking Operations

The first hypothesis test (H1) was conducted to assess the partial influence of risk awareness on the sustainability of banking operations. Multiple linear regression analysis is used by controlling for other variables in the model, to ensure that the resulting influences are independent and statistically significant.

Table 2. Partial Regression Results of Risk Awareness on Sustainable Banking Operations

Variable	Coefficient (b)	t-value	Sig.
Risk Awareness	0.284	2.671	0.009
Constant	1.912	4.103	0.000

The results in Table 2 show that **Risk awareness has a positive and significant effect on sustainable banking operations** ($\beta = 0.284$; $p < 0.05$). These findings confirm H1, which states that the higher the level of employee risk awareness, the stronger the sustainability of banking operations. Risk awareness allows individuals to identify potential operational disruptions early on and adjust work behavior according to the prudential principle, thereby supporting the bank's long-term stability and efficiency.

Dominant Role of Risk Management Culture in Supporting Sustainability

The second hypothesis (H2) test aims to identify the role of risk management culture as a determinant of organizational collective behavior in supporting operational sustainability. This variable was partially tested to see the strength and consistency of its influence compared to risk awareness.

Table 3. Partial Regression Results of Risk Management Culture on Sustainable Banking Operations

Variable	Coefficient (b)	t-value	Sig.
Risk Management Culture	0.462	4.118	0.000
Constant	1.245	2.987	0.004

Table 3 shows that **Risk management culture has a positive and very significant influence** on the sustainability of banking operations ($\beta = 0.462$; $p < 0.001$). The value of a greater coefficient than risk awareness indicates that the risk management culture is a more dominant and consistent factor in supporting sustainable operational practices. These findings confirm that the sustainability of banking is not only determined by individual understanding, but also by the collective values, norms, and habits embedded in the organization.

Simultaneous Effect of Risk Awareness and Risk Management Culture

The fifth hypothesis test (H5) was conducted to assess the simultaneous influence of risk awareness and risk management culture on sustainable banking operations. The F-test is used to ascertain whether the two independent variables together make a significant contribution to the dependent variable.

Table 4. Simultaneous Regression Results (F-test)

Model	F-value	Sig.
Regression Model	29.846	0.000

Table 5. Model Summary

R	R Square	Adjusted R Square
0.661	0.437	0.422

The results of the simultaneous tests in Table 4 show that the overall regression model **statistically significant** ($p < 0.001$). The Adjusted R Square value of 0.422 in Table 5 indicates that **42.2% variation in the sustainability of banking operations can be explained by risk awareness and risk management culture simultaneously**. These findings confirm H5 and affirm that the combination of individual risk awareness and organizational risk management culture is an important foundation for the sustainability of banking operations.

DISCUSSION

The main results of this study show that risk awareness and risk management culture have a significant role in supporting the sustainability of banking operations. These findings confirm that the sustainability of banking is not only determined by formal structural and regulatory frameworks, but is also strongly influenced by aspects of organizational behavior and culture. Theoretically, these results are in line with a human-centered risk governance approach that places individuals as a key component in an organization's risk management system. This approach asserts that the effectiveness of risk management depends on the extent to which risk values and understandings are internalized in daily work practices (Kaplan & Mikes, 2021).

The positive and significant influence of risk awareness on sustainable banking operations suggests that an individual's understanding of risk is an important foundation for institutional stability in the long term. Employees with a high level of risk awareness tend to be better able to anticipate potential operational disruptions and consider the strategic implications of any decision made. These findings are in line with risk perception theory which states that an individual's perception of risk affects the quality of organizational decision-making (Slovic et al. 2020). In the context of regional banking, this condition is becoming increasingly relevant because limited resources demand prudence and accuracy in the implementation of operations.

Although it has a significant effect, the power of risk awareness is relatively lower than that of risk management culture. This shows that individual understanding is not enough to ensure operational sustainability if it is not

strengthened by the organization's collective values and norms. Empirical studies by Kallenberg and Scarbrough (2022) confirm that risk awareness will only have an optimal impact when supported by a consistent and internalized organizational culture system. Thus, risk awareness serves as a cognitive prerequisite that requires institutional legitimacy to be able to produce sustainable impact.

Risk management culture has been proven to have a stronger and more consistent influence on the sustainability of banking operations. These findings support the perspective of cultural control theory which views culture as an effective informal control mechanism in shaping the collective behavior of organizations. A strong culture of risk creates alignment between formal policies and operational practices, thus encouraging compliance that is intrinsic and sustainable (Martin et al. 2021). In the banking sector, risk management culture plays a strategic role in minimizing opportunistic behavior that has the potential to threaten institutional stability and reputation.

The results of the simultaneous testing showed that risk awareness and risk management culture together explain a significant proportion of the variation in the sustainability of banking operations. These findings reinforce an integrative approach in risk management that combines the cognitive dimension of the individual with the normative dimension of the organization. Research by Florio and Leoni (2023) shows that risk management systems that integrate behavioral and cultural aspects tend to be more adaptive to changes in the business environment. Therefore, banking sustainability needs to be understood as the result of dynamic interactions between individuals, organizational structures, and evolving collective values.

A number of contextual factors also influenced the results of this study, especially the characteristics of conventional commercial banks at the regional level. The limitations of the organizational structure and the high dependence on human resources make organizational culture the dominant factor in determining the effectiveness of risk management. However, this study has methodological limitations, especially the use of cross-sectional designs that have not been able to capture temporal changes in risk culture. In addition, the use of perception-based data has the potential to give rise to biased common methods that do not fully reflect actual operational practices (Conway & Lance, 2021).

Based on these findings and limitations, further research is recommended to use a longitudinal design to observe the dynamics of the development of risk awareness and risk management culture over time. The integration of qualitative methods, such as in-depth interviews or ethnographic studies of organizations, can also enrich understanding of the process of internalizing risk cultures. Theoretically, this research contributes to the development of risk management studies by emphasizing the importance of behavioral and cultural dimensions in the framework of sustainable banking. In practical terms, the results of this study provide strategic implications for bank management and regulators to prioritize strengthening the risk culture as the foundation for long-term operational sustainability.

CONCLUSION AND RECOMMENDATION

This study concludes that risk awareness and risk management culture are key factors in supporting the sustainability of conventional commercial bank operations at the regional level. The results of the analysis show that risk awareness has a positive and significant effect on sustainable banking operations, while risk management culture has a stronger and more consistent influence, both partially and simultaneously. These findings confirm that the sustainability of banking operations is not only determined by compliance with formal regulations, but also by the internalization of values, behaviors, and risk cultures within organizations. Thus, strengthening the risk management culture and increasing employee risk awareness is an important strategy for bank management in maintaining long-term operational stability and sustainability.

FURTHER STUDY

Future research is recommended to expand the analysis of risk awareness and risk management culture by involving different types of banks, such as Islamic banks, national private banks, and digital banks, to compare sustainability dynamics across banking models. Further studies could also incorporate additional variables, including leadership style, organizational learning, and regulatory pressure, to better explain how risk culture is formed and sustained over time. Moreover, longitudinal research designs would be valuable to examine the long-term impact of risk management culture on financial resilience and sustainability performance under changing economic conditions. Such research would strengthen the empirical understanding of risk-based sustainability strategies in the banking sector.

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