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The role of risk management and technology adoption in enhancing the effect of human capital on financial performance: Evidence from village credit institution in Bali, Indonesia

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Abstract---Village Credit Institutions (*Lembaga Perkreditan Desa*—LPDs) represent unique indigenous microfinance institutions operating within Balinese customary villages. Despite their significant contribution to rural financial inclusion and local economic development, disparities between asset growth and financial performance remain evident among many LPDs. This phenomenon suggests that financial sustainability depends not only on financial resources but also on strategic organizational capabilities, including human capital, effective risk management, and technology adoption. Grounded in the Resource-Based View (RBV) Theory and the Technology Acceptance Model (TAM), this study examines the direct effect of human capital on financial performance, the mediating role of risk management, and the moderating role of technology adoption. Using a quantitative explanatory approach, this study employs panel data collected from 81 Village Credit Institutions in Badung Regency during 2022–2024. Panel regression analysis is used to examine the

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proposed relationships among variables. The findings indicate that human capital significantly improves financial performance, while risk management also positively influences financial performance. However, risk management does not mediate the relationship between human capital and financial performance because human capital has no significant effect on risk management. Likewise, technology adoption fails to strengthen the relationship between human capital and financial performance. The findings reinforce the Resource-Based View by confirming that human capital remains the most valuable strategic resource in enhancing financial performance. Nevertheless, technology adoption alone cannot generate superior organizational performance without adequate organizational readiness, governance quality, and managerial capability. The study contributes to the literature on indigenous microfinance institutions by integrating strategic management and information systems perspectives within a unique socio-cultural organizational context.

Keywords---Human Capital, Financial Performance, Risk Management, Technology Adoption, Village Credit Institution.

1. Introduction

Financial sustainability has become one of the primary concerns of financial institutions worldwide due to increasing competition, rapid technological advancement, and dynamic economic environments. Financial institutions are expected not only to maintain profitability but also to ensure operational resilience and long-term sustainability. Consequently, financial performance has become one of the most widely accepted indicators for assessing an organization's ability to efficiently utilize its resources and achieve its strategic objectives (Gitosudarmo & Basri, 2002; Ikatan Akuntan Indonesia [IAI], 2016; Ichsan et al., 2021). Moreover, financial performance constitutes the foundation of organizational sustainability because it reflects management's capability to generate economic value while maintaining financial stability (Hussain et al., 2025).

Previous studies have demonstrated that financial performance is influenced by numerous internal and external factors. Internal determinants include management efficiency, operational efficiency, corporate governance, innovation capability, research and development, and organizational resources (Aguilera et al., 2018; Ahmad et al., 2020; Delis et al., 2023; Grżeta et al., 2023; Hall & Rosenberg, 2010; Haufler & Schindler, 2023; Trinks et al., 2020; Wei et al., 2020). External determinants include economic conditions, competitive environments, technological advancement, political stability, and socio-cultural factors (Abou-Foul et al., 2021; Alfadli & Rjoub, 2020; Bashir et al., 2021; Bashir et al., 2024; Gursoy, 2006; Henisz, 2017; Hussain et al., 2021; Okafor et al., 2021). Among these determinants, human capital has increasingly received attention because of its ability to generate sustainable competitive advantages that are difficult for competitors to imitate.

Within Indonesia's financial system, Village Credit Institutions (*Lembaga Perkreditan Desa*—LPDs) constitute one of the most distinctive indigenous financial institutions. Unlike commercial banks and rural credit banks (*Bank Perkreditan Rakyat*), LPDs operate exclusively within Balinese customary villages (*desa adat*) and are established to improve community welfare through locally based financial services. Their organizational governance is deeply rooted in customary law, social trust, and local wisdom, making LPDs unique among microfinance institutions.

Over the last three decades, LPDs have demonstrated remarkable institutional development. Their total assets have continued to increase and currently exceed those of Rural Credit Banks operating in Bali. Such growth reflects the high level of public trust placed in LPDs as community-based financial institutions. Nevertheless, increasing asset accumulation has not always been accompanied by proportional improvements in profitability. Several LPDs possessing relatively large asset portfolios continue to exhibit relatively low Return on Assets (ROA), suggesting that financial resources alone are insufficient to guarantee superior financial performance. This discrepancy indicates that intangible organizational resources deserve greater scholarly attention.

The Resource-Based View (RBV) Theory argues that organizations achieve sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). Among these strategic resources, human capital has consistently been recognized as one of the most critical organizational assets. Human capital encompasses employees' knowledge, competencies, professional skills, creativity, experience, and problem-solving abilities that collectively enable organizations to improve productivity, innovation, and organizational performance. Unlike tangible resources, human capital continuously develops through organizational learning, education, and professional experience, making it considerably more difficult for competitors to replicate.

The strategic importance of human capital is particularly evident within Village Credit Institutions because organizational performance depends heavily upon employee competence in managing savings, lending activities, financial reporting, customer relationships, and community engagement. Employees simultaneously function as financial service providers and representatives of customary institutions, requiring both professional expertise and socio-cultural understanding.

Despite its strategic role, the quality of human capital within many Village Credit Institutions remains relatively limited. Dewi et al. (2022) reported that most LPD employees possess only junior or senior high school educational backgrounds, resulting in relatively low levels of professional competence. Such limitations may hinder organizational productivity, reduce service quality, and ultimately weaken financial performance. Consequently, improving employee competencies has become an essential prerequisite for strengthening the long-term sustainability of Village Credit Institutions.

In addition to educational limitations, many LPD employees continue to experience difficulties in utilizing digital technology effectively. Limited technological competence frequently delays operational processes, reduces work efficiency, and constrains institutional performance (Anggereni, 2019). These conditions have become increasingly important because digital transformation has fundamentally altered the financial services industry. Information technology no longer functions merely as an operational support system but has evolved into a strategic resource capable of improving organizational competitiveness.

Technology adoption has become one of the most influential drivers of organizational transformation in modern financial institutions. Kauffman and Riggins (2012) argued that technology adoption constitutes one of the critical determinants of sustainability for microfinance institutions because technological innovation enhances efficiency, expands service accessibility, and reduces operational costs. Likewise, Harto et al. (2023) emphasized that organizations capable of adapting to technological change and effectively utilizing information systems are more likely to establish sustainable competitive advantages in the digital economy.

The Technology Acceptance Model (TAM), originally introduced by Davis (1989), provides one of the most widely accepted theoretical explanations regarding individual acceptance of information technology. TAM proposes that technology utilization is primarily determined by users' perceptions of usefulness (*perceived usefulness*) and ease of use (*perceived ease of use*) (Davis, 1989; Davis et al., 1989). Owing to its conceptual simplicity and strong empirical support, TAM has become one of the most extensively applied frameworks for investigating technology adoption across various organizational settings (Chuttur, 2009; King & He, 2006). Subsequent studies have further demonstrated that TAM effectively explains users' behavioral intentions toward adopting emerging technologies (Clipa & Greciuc, 2018; Clipa et al., 2014; Mățã et al., 2020).

Within the operational context of Village Credit Institutions, technology adoption is expected to improve operational efficiency, accelerate financial reporting, facilitate transaction processing, and enhance service quality. Consequently, technology adoption may strengthen the contribution of human capital toward financial performance by enabling employees to utilize their competencies more effectively. Nevertheless, successful technology implementation depends not merely upon technological availability but also upon employees' willingness and capability to integrate digital technologies into daily organizational activities.

Besides human capital and technology adoption, effective risk management has become another fundamental prerequisite for achieving superior organizational performance. Financial institutions inherently face various forms of uncertainty, including credit risk, liquidity risk, operational risk, and strategic risk. Enterprise Risk Management (ERM) enables organizations to systematically identify, evaluate, monitor, and mitigate these uncertainties before they adversely affect organizational objectives. Effective implementation of risk management therefore contributes to organizational resilience, operational efficiency, and financial sustainability.

From the Resource-Based View perspective, organizational capability in managing risks represents another strategic organizational capability that can improve financial performance. However, the effectiveness of risk management depends substantially upon the competence of human resources responsible for implementing risk management policies. Employees possessing superior analytical abilities, professional judgment, and organizational knowledge are expected to identify risks more accurately and formulate more effective mitigation strategies. Accordingly, risk management may function as an intermediary mechanism through which human capital enhances financial performance.

Although previous studies have independently examined the relationships among human capital, technology adoption, risk management, and financial performance, empirical evidence integrating these variables within indigenous financial institutions remains limited. Most previous studies have concentrated on commercial banks, manufacturing companies, or publicly listed corporations operating within formal institutional environments. Consequently, relatively little is known regarding how these strategic organizational resources interact within community-based financial institutions operating under customary governance systems.

Therefore, this study seeks to address this research gap by investigating the direct influence of human capital on financial performance while simultaneously examining the mediating role of risk management and the moderating role of technology adoption among Village Credit Institutions in Badung Regency, Bali. By integrating the Resource-Based View Theory with the Technology Acceptance Model, this study is expected to enrich the strategic management literature concerning microfinance institutions while providing practical recommendations for strengthening the sustainability and competitiveness of Village Credit Institutions in the digital era.

2. Literature Review and Hypothesis Development

2.1 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) has become one of the most influential theoretical perspectives in strategic management for explaining differences in organizational performance. Barney (1991) argues that organizations achieve sustainable competitive advantage by possessing strategic resources that are valuable, rare, inimitable, and non-substitutable (VRIN). Unlike external market conditions, RBV emphasizes that internal organizational resources constitute the primary source of long-term competitiveness.

Strategic resources include both tangible assets, such as financial capital and physical infrastructure, and intangible assets, including organizational knowledge, managerial capability, innovation, corporate culture, and human capital. Among these resources, intangible assets are generally considered more difficult for competitors to imitate because they develop gradually through organizational learning and accumulated experience (Barney, 1991).

Subsequent studies have extended the RBV perspective by emphasizing that organizational capability is not solely determined by resource ownership but also

by the organization's ability to effectively utilize, integrate, and transform these resources into superior organizational performance (Hall & Rosenberg, 2010; Trinks et al., 2020). Therefore, organizations possessing abundant financial resources may still experience poor financial performance if they fail to manage their strategic resources efficiently.

Within financial institutions, human capital represents one of the most valuable strategic resources because employees are directly responsible for customer service, lending decisions, risk assessment, financial reporting, and innovation. Consequently, organizations with highly competent employees generally exhibit superior productivity, service quality, operational efficiency, and financial performance.

For Village Credit Institutions (LPDs), the RBV framework is particularly relevant because their organizational success depends largely on intangible resources rather than sophisticated physical infrastructure. Customer trust, local knowledge, employee competence, and organizational reputation constitute strategic assets that are embedded within customary village institutions and therefore cannot easily be replicated by competing financial institutions.

Accordingly, the Resource-Based View provides a strong theoretical foundation for explaining why investments in human capital may ultimately improve financial performance.

2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was originally proposed by Davis (1986) and further developed by Davis (1989) and Davis et al. (1989) to explain why individuals accept or reject information technology. TAM was adapted from the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen, which assumes that behavioral intention is influenced by an individual's attitude toward performing a particular behavior. However, TAM extends TRA by incorporating technological characteristics into behavioral analysis.

The model proposes two primary determinants of technology acceptance: **Perceived Usefulness (PU)** and **Perceived Ease of Use (PEOU)** (Davis, 1989). Perceived usefulness refers to an individual's belief that using a particular technological system will improve job performance, whereas perceived ease of use refers to the extent to which an individual believes that using the system requires minimal effort.

According to Davis et al. (1989), both perceptions influence users' attitudes toward technology adoption, which subsequently affect their behavioral intention to use technology. Numerous empirical studies have consistently demonstrated that perceived usefulness exerts a stronger influence than perceived ease of use because users are generally willing to tolerate technological complexity if substantial performance improvements can be achieved (King & He, 2006).

Although several extensions of TAM have been developed, including TAM2, TAM3, and the Unified Theory of Acceptance and Use of Technology (UTAUT), the original TAM remains one of the most frequently applied models because of its conceptual

simplicity and strong explanatory capability (Chuttur, 2009). Compared with UTAUT, TAM requires fewer constructs and provides a more parsimonious framework for understanding technology adoption (Aplin-Houtz et al., 2023).

Previous studies have successfully applied TAM across various contexts, including banking, education, healthcare, e-commerce, and financial technology (Clipa & Greciuc, 2018; Clipa et al., 2014; Măță et al., 2020). These studies generally conclude that users who perceive technological systems as useful and easy to operate are more likely to adopt technology effectively.

Within Village Credit Institutions, technology adoption is expected to facilitate transaction processing, improve financial reporting accuracy, reduce operational costs, and enhance customer service quality. Therefore, employees' acceptance of technology may strengthen the contribution of human capital toward organizational performance.

2.3 Human Capital

Human capital has evolved into one of the most widely discussed concepts in strategic management, organizational behavior, and financial management. It refers to the accumulated knowledge, competencies, education, professional skills, creativity, innovation capability, and experience possessed by employees that collectively contribute to organizational value creation.

Unlike physical capital, human capital continuously develops through education, organizational learning, professional training, and accumulated work experience. Consequently, organizations investing in employee development generally experience higher productivity, innovation capability, and long-term competitiveness.

Within financial institutions, human capital performs a particularly strategic role because organizational success depends heavily on employees' analytical capability, communication skills, ethical behavior, and decision-making quality. Employees directly influence customer satisfaction, lending quality, operational efficiency, and financial reporting accuracy.

Previous empirical studies consistently indicate that organizations possessing superior human capital achieve higher financial performance because employee competence improves organizational productivity while reducing operational inefficiency (Ahmad et al., 2020; Wei et al., 2020; Delis et al., 2023).

However, Dewi et al. (2022) reported that many Village Credit Institutions continue to experience relatively low employee competence because most employees possess only junior or senior secondary educational backgrounds. This educational limitation restricts their ability to adapt to increasingly sophisticated financial technology and complex financial management practices.

Furthermore, Anggereni (2019) observed that limited digital competence among LPD employees often delays operational activities and reduces organizational productivity. Therefore, continuous investment in education, professional

certification, and technological competency development becomes essential for ensuring institutional sustainability.

From the Resource-Based View perspective, human capital constitutes an intangible strategic asset capable of generating sustainable competitive advantage because organizational knowledge and employee competencies cannot easily be replicated by competitors (Barney, 1991).

2.4 Financial Performance

Financial performance represents one of the most comprehensive indicators of organizational success because it reflects management's effectiveness in utilizing organizational resources over a specific accounting period. According to Gitosudarmo and Basri (2002), financial performance encompasses the overall financial achievements reported through financial statements, including balance sheets and income statements.

Financial performance also reflects organizational health and managerial effectiveness in controlling available resources (IAI, 2016; Ichsan et al., 2021). Organizations demonstrating superior financial performance generally possess stronger liquidity, profitability, operational efficiency, and long-term sustainability (Hussain et al., 2025).

Previous literature identifies numerous determinants of financial performance. Internal determinants include innovation, management efficiency, operational efficiency, research and development, corporate governance, organizational capability, and financial structure (Aguilera et al., 2018; Ahmad et al., 2020; Delis et al., 2023; Hall & Rosenberg, 2010; Trinks et al., 2020; Wei et al., 2020). External determinants include macroeconomic conditions, technological advancement, political stability, competitive intensity, and socio-cultural environments (Abou-Foul et al., 2021; Bashir et al., 2021; Bashir et al., 2024; Henisz, 2017; Hussain et al., 2021).

In this study, financial performance is measured using Return on Assets (ROA), which reflects management's ability to generate net income from total organizational assets. ROA is widely employed in banking and microfinance research because it captures both profitability and asset utilization efficiency.

2.5 Enterprise Risk Management

Risk has become an inseparable component of organizational activities, particularly within financial institutions whose operations are characterized by uncertainty and exposure to various financial and non-financial risks. Every lending decision, investment activity, liquidity management strategy, and operational process contains inherent risks that may adversely affect organizational sustainability if they are not appropriately managed. Consequently, risk management has evolved from a merely protective mechanism into a strategic organizational capability that contributes directly to value creation and competitive advantage.

According to the Committee of Sponsoring Organizations of the Treadway Commission (COSO, 2017), Enterprise Risk Management (ERM) is defined as "the

culture, capabilities, and practices integrated with strategy-setting and performance that organizations rely on to manage risk in creating, preserving, and realizing value." Unlike traditional risk management, which focuses on individual risk categories, ERM adopts an integrated approach by considering organizational risks holistically and aligning risk management with strategic decision-making processes.

Similarly, the International Organization for Standardization (ISO 31000:2018) defines risk management as coordinated activities to direct and control an organization regarding risk. ISO 31000 emphasizes that effective risk management should be integrated into governance structures, organizational culture, strategic planning, and operational activities to improve organizational resilience and decision-making quality.

Within the banking and financial services industry, risk management encompasses several major categories of risk, including credit risk, liquidity risk, market risk, operational risk, legal risk, compliance risk, strategic risk, and reputational risk. The complexity of these risks has increased substantially following financial globalization, digital transformation, and growing regulatory requirements. Consequently, financial institutions are required to establish comprehensive risk management systems capable of identifying, assessing, monitoring, and mitigating potential threats before they significantly affect organizational performance.

From the Resource-Based View perspective, organizational capability in managing risk represents a valuable intangible capability that contributes to sustainable competitive advantage. Barney (1991) argues that competitive advantage arises not only from possessing valuable resources but also from organizational capabilities that enable firms to utilize those resources more effectively than competitors. Effective risk management constitutes one such organizational capability because it improves managerial decision-making, enhances resource allocation efficiency, and minimizes unnecessary financial losses.

Previous empirical studies consistently demonstrate that effective Enterprise Risk Management positively contributes to organizational performance. Hoyt and Liebenberg (2011), for example, found that organizations implementing ERM generally exhibit higher firm value than organizations employing fragmented risk management practices. Likewise, Gordon et al. (2009) argued that ERM improves strategic decision-making by enabling managers to better evaluate organizational uncertainties and allocate resources more efficiently.

Within financial institutions, successful implementation of risk management contributes to improved loan quality, reduced non-performing loans, enhanced operational efficiency, stronger governance, and greater stakeholder confidence. These improvements ultimately increase organizational profitability while reducing financial volatility.

In the context of Village Credit Institutions (LPDs), effective risk management becomes increasingly important because lending activities represent the primary source of institutional income. Poor credit assessment, weak internal controls,

inadequate monitoring systems, and insufficient governance may increase non-performing loans and significantly reduce profitability. Therefore, integrating risk management into organizational strategy is expected to improve financial performance while ensuring long-term institutional sustainability.

2.6 Technology Adoption

Technological advancement has fundamentally transformed the financial services industry over the last two decades. Rapid developments in digital banking, financial technology (FinTech), cloud computing, artificial intelligence, big data analytics, blockchain technology, and mobile applications have changed how financial institutions deliver services, manage information, and interact with customers.

For financial institutions, technology adoption is no longer considered merely an operational necessity but rather a strategic investment capable of generating competitive advantage. Organizations adopting digital technologies generally experience greater operational efficiency, lower transaction costs, improved customer satisfaction, faster information processing, and enhanced managerial decision-making (Kauffman & Riggins, 2012).

Technology adoption refers to the extent to which an organization successfully implements and utilizes technological innovations within its operational activities. According to Davis (1989), successful technology adoption depends primarily on users' perceptions regarding usefulness and ease of use. Employees are more likely to adopt technological systems when they believe those systems improve work performance while requiring relatively little effort to operate.

Numerous empirical studies have confirmed the validity of the Technology Acceptance Model (TAM) across different organizational settings. King and He (2006) concluded through a comprehensive meta-analysis that TAM consistently explains users' behavioral intentions toward information technology adoption across various industries. Similarly, Chuttur (2009) emphasized that TAM remains one of the most influential theoretical frameworks for investigating organizational technology acceptance because of its strong predictive capability.

Recent studies further indicate that technology adoption improves organizational productivity by facilitating knowledge sharing, reducing operational complexity, accelerating decision-making, and enhancing service quality (Harto et al., 2023). Consequently, organizations capable of integrating technological innovation with employee competence are generally more successful in achieving superior organizational performance.

Within Village Credit Institutions, technology adoption includes the implementation of computerized accounting systems, digital transaction services, mobile banking applications, electronic payment systems, integrated customer databases, and digital reporting mechanisms. These technological innovations improve operational efficiency while simultaneously increasing service accessibility for rural communities.

Nevertheless, technology adoption alone does not automatically improve organizational performance. Successful digital transformation depends upon organizational readiness, employee competency, managerial commitment, organizational culture, and continuous technological learning. Therefore, technology functions primarily as an organizational enabler whose effectiveness depends upon the capability of human resources responsible for utilizing technological systems.

Accordingly, technology adoption is expected to strengthen the contribution of human capital toward financial performance because employees possessing superior competencies can utilize digital technologies more effectively than less competent employees.

2.7 Research Gap

Although previous studies have extensively examined the determinants of financial performance, several important research gaps remain.

First, previous empirical research predominantly investigates commercial banks, publicly listed corporations, manufacturing firms, or multinational organizations operating within formal institutional environments (Ahmad et al., 2020; Delis et al., 2023; Wei et al., 2020). Comparatively little attention has been devoted to indigenous community-based financial institutions such as Village Credit Institutions operating under customary governance systems. Consequently, the applicability of existing strategic management theories within unique socio-cultural organizational contexts remains insufficiently understood.

Second, previous studies generally examine human capital, risk management, and technology adoption independently rather than integrating these strategic organizational resources within a comprehensive theoretical framework. Such fragmented approaches limit understanding of how organizational capabilities interact in influencing financial performance.

Third, empirical findings concerning the relationship between human capital and financial performance remain inconsistent. While numerous studies report positive and significant relationships (Ahmad et al., 2020; Wei et al., 2020), others indicate that human capital alone cannot guarantee superior organizational performance without complementary organizational capabilities such as governance quality, technological capability, and effective risk management.

Fourth, although Enterprise Risk Management has increasingly attracted scholarly attention, relatively few studies investigate its mediating role between strategic organizational resources and financial performance, particularly within microfinance institutions.

Finally, despite the growing importance of digital transformation, evidence regarding the moderating role of technology adoption remains inconclusive. Some studies suggest that technology strengthens organizational capability, whereas others argue that technological investment generates limited benefits without sufficient organizational readiness and employee competence.

Accordingly, this study seeks to address these research gaps by simultaneously examining the direct influence of human capital on financial performance, the mediating role of Enterprise Risk Management, and the moderating role of technology adoption within Village Credit Institutions in Bali.

2.8 Hypothesis Development

a. Human Capital and Financial Performance

The Resource-Based View (RBV) argues that organizations possessing valuable and difficult-to-imitate resources achieve superior organizational performance (Barney, 1991). Human capital represents one of the most strategic intangible resources because employees' knowledge, competencies, professional skills, creativity, and experience contribute directly to organizational productivity and innovation.

Within financial institutions, employee competence significantly influences lending quality, customer satisfaction, operational efficiency, financial reporting accuracy, and strategic decision-making. Consequently, organizations investing continuously in employee development are expected to achieve stronger financial performance.

Previous empirical studies consistently support this relationship. Ahmad et al. (2020), Wei et al. (2020), and Delis et al. (2023) found that human capital positively influences financial performance by improving organizational efficiency and competitiveness.

H1: Human capital positively affects financial performance.

b. Human Capital and Enterprise Risk Management

Enterprise Risk Management requires employees to possess strong analytical capabilities, professional judgment, and comprehensive organizational knowledge to identify, evaluate, and mitigate organizational risks effectively.

According to the Resource-Based View, organizational capabilities originate primarily from the quality of human resources responsible for implementing organizational strategies (Barney, 1991). Employees possessing higher competencies are expected to implement more effective risk management practices.

H2: Human capital positively affects Enterprise Risk Management.

c. Enterprise Risk Management and Financial Performance

Enterprise Risk Management enables organizations to identify and mitigate uncertainties before they adversely affect organizational objectives. Effective risk management reduces financial losses, improves governance quality, enhances operational efficiency, and strengthens stakeholder confidence (COSO, 2017).

Previous empirical studies indicate that organizations implementing integrated Enterprise Risk Management generally achieve superior financial performance than organizations employing fragmented risk management systems.

H3: Enterprise Risk Management positively affects financial performance.

d. The Mediating Role of Enterprise Risk Management

Although competent employees contribute directly to organizational performance, their contribution may become more effective when organizational knowledge is translated into structured risk management practices.

Employees possessing superior competencies are expected to improve Enterprise Risk Management implementation, which subsequently enhances organizational performance by minimizing unnecessary risks and improving strategic decision-making.

H4: Enterprise Risk Management mediates the relationship between human capital and financial performance.

e. The Moderating Role of Technology Adoption

Technology adoption facilitates organizational efficiency by enabling employees to perform organizational tasks more effectively. According to the Technology Acceptance Model (Davis, 1989), employees who perceive technological systems as useful and easy to use are more likely to integrate technology into their work activities.

Employees possessing superior competencies are expected to utilize technology more effectively, thereby strengthening the positive influence of human capital on financial performance.

H5: Technology adoption positively moderates the relationship between human capital and financial performance.

3. Research Method

3.1 Research Design

This study employed a quantitative explanatory research design to examine the relationships among human capital, risk management, technology adoption, and financial performance in Village Credit Institutions (*Lembaga Perkreditan Desa*—LPDs). The explanatory approach was selected because the study aims to test the causal relationships proposed in the conceptual framework and to verify the hypotheses developed from the Resource-Based View (RBV) Theory and the Technology Acceptance Model (TAM).

The study used panel data by combining cross-sectional and time-series observations. Panel data provide several advantages over cross-sectional or time-series data alone, including greater variability, higher degrees of freedom, lower multicollinearity, and more efficient parameter estimation. The analytical framework employed **path analysis** through **panel data regression** using **EViews version 9.0**, allowing the simultaneous examination of direct, mediating, and moderating effects among the research variables.

3.2 Research Setting

The research was conducted at Village Credit Institutions (LPDs) located in **Badung Regency, Bali Province, Indonesia**. Badung Regency was selected because it has one of the largest numbers of active LPDs in Bali and represents one of the strongest customary-based financial systems in Indonesia. Furthermore, LPDs in Badung manage substantial financial assets and exhibit considerable variation in organizational performance, making them an appropriate empirical setting for investigating the determinants of financial performance. The observation period covered **2022–2024**, enabling the study to capture recent organizational performance while minimizing short-term fluctuations.

3.3 Research Scope

The scope of this research was limited to examining the influence of Human Capital on Financial Performance, with Risk Management functioning as a mediating variable and Technology Adoption acting as a moderating variable. Financial performance was measured using Return on Assets (ROA), human capital using Human Capital Efficiency (HCE), risk management using the Enterprise Risk Management Index (ERMI), and technology adoption based on the level of technology implementation within each LPD.

3.4 Variables and Operational Definitions

This study consists of one dependent variable, one independent variable, one mediating variable, and one moderating variable.

a. Financial Performance

Financial performance represents the dependent variable and reflects the ability of an LPD to generate profit from its available assets. Consistent with banking and microfinance studies, financial performance is measured using **Return on Assets (ROA)**, which indicates managerial efficiency in utilizing total assets to generate earnings.

b. Human Capital

Human capital is the independent variable and represents employees' knowledge, competencies, skills, experience, and professional capabilities that contribute to organizational value creation. In accordance with the research model, human capital is measured using **Human Capital Efficiency (HCE)** derived from the Value Added Intellectual Coefficient (VAIC) model.

c. Risk Management

Risk management serves as the mediating variable and reflects the organization's capability to identify, assess, control, and monitor risks associated with lending activities and overall organizational operations. In this study, risk management is measured using the **Enterprise Risk Management Index (ERMI)**.

d. Technology Adoption

Technology adoption functions as the moderating variable and reflects the extent to which digital technology has been implemented in LPD operational activities. Information regarding technology adoption was obtained through **deep interviews with the chairpersons of each Village Credit Institution** to determine the level of technological implementation in daily operations.

3.5 Population and Sample

The population consisted of **all active Village Credit Institutions in Badung Regency**. Because the total number of LPDs was relatively limited, this study employed a **saturated sampling (census)** technique, whereby all **81 Village Credit Institutions** were included in the analysis.

Using a three-year observation period (2022–2024), the study generated a balanced panel consisting of **243 firm-year observations**, providing sufficient variation for panel regression analysis.

3.6 Data Sources and Data Collection

The primary data source consisted of **secondary financial data** obtained from annual financial statements of Village Credit Institutions covering the 2022–2024 period. These financial statements were collected from the **Village Credit Institution Development Agency (LP-LPD) of Badung Regency**. The financial

statements were subsequently used to calculate Financial Performance (ROA), Human Capital Efficiency (HCE), and Enterprise Risk Management Index (ERMI). Information regarding **Technology Adoption** was collected through **in-depth interviews** with the chairperson of each LPD to determine whether digital technology had been implemented within institutional operations.

Data collection employed a **non-participant observation** method, whereby the researcher analyzed documentary evidence contained in the financial statements without directly participating in organizational activities.

3.7 Data Analysis

First, descriptive statistics were performed to summarize the characteristics of each research variable by calculating the minimum value, maximum value, mean, and standard deviation (Sekaran & Bougie, 2016).

Second, inferential analysis employed **panel data regression** combined with **path analysis**. Panel regression was selected because the dataset consists of both time-series observations (2022–2024) and cross-sectional observations across 81 Village Credit Institutions.

To determine the most appropriate estimation model, three panel-data specifications were evaluated such as Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM)

The final model selection was based on the **Chow Test**, **Hausman Test**, and **Breusch–Pagan Lagrange Multiplier Test**, following the analytical procedure adopted in the thesis. The test results indicated that the **Random Effect Model** was the most appropriate specification for hypothesis testing.

The structural relationships among variables were estimated in three stages:

$$\begin{aligned} ERM &= \alpha + \beta_1 HC + \varepsilon \\ FP &= \alpha + \beta_1 HC + \beta_2 ERM + \varepsilon \\ FP &= \alpha + \beta_1 HC + \beta_2 ERM + \beta_3 TA + \beta_4 (HC \times TA) + \varepsilon \end{aligned}$$

where **FP** denotes Financial Performance, **HC** represents Human Capital, **ERM** represents Risk Management, and **TA** denotes Technology Adoption. These equations correspond to the three-stage regression procedure reported in the thesis appendices, including the moderation model with the interaction term (**M2_X**).

4. Results

4.1 Descriptive Statistics

Descriptive statistics were employed to provide an overview of the characteristics of the research variables. The analysis includes the minimum value, maximum value, mean, and standard deviation for Human Capital (HC), Risk Management (ERM), Technology Adoption (TA), and Financial Performance (ROA).

Variable	Period	Minimum	Maximum	Mean	Standard Deviation
<i>Financial Performance</i>	2022	0.1200	6.3200	2.0317	1.2052
	2023	0.3900	4.6800	1.9401	0.9323
	2024	0.0700	7.7600	1.9535	1.1389
<i>Human Capital</i>	2022	1.0915	3.6375	2.2267	0.5813
	2023	1.2520	3.5619	2.3075	0.5426

Variable	Period	Minimum	Maximum	Mean	Standard Deviation
<i>Risk Management</i>	2024	1.0894	3.5142	2.3138	0.5344
	2022	-1.4225	2.8856	0.5921	1.0661
	2023	-1.3332	3.0176	0.5285	1.0798
<i>Technology Adoption</i>	2024	-1.4385	3.5160	0.5218	1.0795
	2022	0.0000	1.0000	0.0988	0.3002
	2023	0.0000	1.0000	0.1975	0.4006
	2024	0.0000	1.0000	0.2099	0.4098

The descriptive statistics indicate that all variables exhibit sufficient variation among Village Credit Institutions during the observation period. The variability suggests differences in managerial capability, implementation of risk management, technology utilization, and financial performance across LPDs in Badung Regency. Such variation supports the suitability of panel data regression for hypothesis testing because it captures both cross-sectional and time-series differences.

4.2 Panel Data Model Selection

The model selection demonstrated that the **Random Effect Model (REM)** was the most appropriate specification for estimating the proposed relationships because it provided the best statistical fit according to the decision criteria reported in the thesis.

4.3 Hypothesis Testing

4.3.1 Effect of Human Capital on Financial Performance

The regression results indicate that **Human Capital has a positive and statistically significant effect on Financial Performance**, supporting **Hypothesis 1**. This finding suggests that higher Human Capital Efficiency contributes to better organizational profitability among Village Credit Institutions. The positive coefficient indicates that improvements in employee competence, knowledge, and professional capability enable LPDs to utilize organizational resources more efficiently, ultimately improving Return on Assets.

4.3.2 Effect of Human Capital on Risk Management

The estimation results reveal that **Human Capital does not significantly affect Risk Management**. Consequently, **Hypothesis 2 is not supported**.

This finding indicates that improvements in employee capability alone are insufficient to strengthen Enterprise Risk Management practices within Village Credit Institutions. The implementation of risk management appears to depend on additional organizational factors such as governance structures, internal control systems, institutional policies, and managerial commitment.

4.3.3 Effect of Risk Management on Financial Performance

The results demonstrate that **Risk Management positively and significantly affects Financial Performance**, supporting **Hypothesis 3**.

The positive relationship indicates that Village Credit Institutions implementing more effective risk management practices achieve higher financial performance because they are better able to control operational uncertainty, reduce financial losses, and improve organizational efficiency.

4.3.4 Mediating Effect of Risk Management

The mediation analysis indicates that although Risk Management significantly influences Financial Performance, Human Capital does not significantly affect Risk Management. Consequently, the indirect effect is statistically insignificant, indicating that **Enterprise Risk Management does not mediate the relationship between Human Capital and Financial Performance**. Therefore, **Hypothesis 4 is rejected**.

This finding suggests that Human Capital contributes directly to Financial Performance rather than indirectly through improvements in Risk Management implementation.

4.3.5 Moderating Effect of Technology Adoption

The interaction term between Human Capital and Technology Adoption was found to be statistically insignificant. Accordingly, **Technology Adoption does not moderate the relationship between Human Capital and Financial Performance**, resulting in the rejection of **Hypothesis 5**.

The results imply that the contribution of Human Capital to organizational performance remains relatively stable regardless of the level of technology adoption implemented by Village Credit Institutions.

4.4 Summary of Hypothesis Testing

Hypothesis	Proposed Relationship	Result
H1	Human Capital -> Financial Performance	Supported
H2	Human Capital -> Risk Management	Not Supported
H3	Risk Management -> Financial Performance	Supported
H4	Risk Management Mediates Human Capital -> Financial Performance	Not Supported
H5	Technology Adoption Moderates Human Capital -> Financial Performance	Not Supported

The empirical findings indicate that Human Capital remains the principal strategic resource influencing Financial Performance directly. Risk Management contributes positively to Financial Performance but does not serve as the mechanism through which Human Capital affects organizational outcomes. Likewise, Technology Adoption does not significantly strengthen the relationship between Human Capital and Financial Performance.

5. Discussion

This study investigated the direct effect of human capital on financial performance, the mediating role of risk management, and the moderating role of technology adoption in Village Credit Institutions (LPDs) in Badung Regency. The findings provide several important insights into how strategic organizational

resources influence financial sustainability within indigenous microfinance institutions.

5.1 Human Capital and Financial Performance

The empirical findings demonstrate that human capital exerts a positive and statistically significant effect on financial performance. This result indicates that LPDs with higher Human Capital Efficiency (HCE) tend to achieve superior Return on Assets (ROA). Consequently, **Hypothesis 1 is supported.**

This finding confirms that investments in employee knowledge, professional competencies, experience, and organizational skills create economic value by improving operational efficiency and managerial effectiveness. Within Village Credit Institutions, employees perform multiple strategic roles, including credit analysis, savings management, financial reporting, customer relationship management, and maintaining trust within customary communities. Improvements in these competencies therefore contribute directly to organizational profitability.

The findings strongly support the **Resource-Based View (RBV)** proposed by **Barney (1991)**, which argues that organizations obtain sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable (VRIN) resources. Human capital fulfills these criteria because employee knowledge and accumulated organizational experience cannot easily be replicated by competing institutions. Accordingly, human capital represents one of the most important strategic assets available to Village Credit Institutions.

Unlike commercial banks that rely heavily on sophisticated technology and large financial resources, LPDs depend substantially on employee capability and community trust. Employees are expected not only to possess technical financial expertise but also to understand customary regulations, local social structures, and community values. Such capabilities enable LPDs to provide financial services while maintaining strong relationships with members of *desa adat*. Consequently, competent human resources become an essential determinant of organizational sustainability.

The findings are consistent with previous studies reported in the thesis, including **Ahmad et al. (2020)**, **Wei et al. (2020)**, and **Delis et al. (2023)**, which concluded that human capital positively influences organizational performance by improving productivity, innovation capability, and operational efficiency. The present study extends this evidence by demonstrating that the same relationship also applies within indigenous microfinance institutions operating under customary governance systems.

From a managerial perspective, the results imply that improving employee competence should become a strategic priority for LPD management. Investments in education, professional certification, digital literacy, continuous training, and leadership development are likely to generate long-term improvements in financial performance.

5.2 Human Capital and Risk Management

Contrary to expectations, the findings reveal that human capital does not significantly influence risk management. Therefore, **Hypothesis 2 is rejected**. This result suggests that higher employee competence does not automatically translate into better Enterprise Risk Management (ERM) implementation. Although employees may possess adequate knowledge and professional skills, effective risk management also requires formal governance structures, standardized operating procedures, organizational commitment, internal supervision, and institutional support.

The finding indicates that risk management within Village Credit Institutions is predominantly influenced by organizational systems rather than by individual employee capability alone. Employees may understand lending risks and operational uncertainties, but without comprehensive institutional policies and consistent implementation, such knowledge cannot be transformed into effective risk management practices.

From the Resource-Based View perspective, this finding suggests that organizational capability is not generated solely through individual resources but also through the integration of organizational processes and governance mechanisms. Human capital constitutes only one component of organizational capability; effective organizational performance requires complementary resources that work together within an integrated management system.

This finding differs from several previous studies cited in the thesis, which argue that employee competence enhances organizational risk management practices. One possible explanation is that many LPDs continue to rely on traditional decision-making mechanisms based on customary values and collective management. Under such circumstances, formal risk management systems may not yet be sufficiently institutionalized to reflect differences in employee competence.

Another explanation relates to organizational size. Compared with commercial banks, Village Credit Institutions generally employ relatively few staff members. Consequently, risk management responsibilities are often integrated into routine operational activities rather than assigned to specialized risk management units. Such organizational characteristics may weaken the relationship between human capital and Enterprise Risk Management.

5.3 Risk Management and Financial Performance

The analysis indicates that risk management positively and significantly affects financial performance. Thus, **Hypothesis 3 is supported**.

This finding confirms that organizations implementing effective risk management achieve better financial outcomes by reducing operational uncertainty, minimizing financial losses, and improving managerial decision-making. Within Village Credit Institutions, effective management of credit risk, operational risk, and liquidity risk contributes directly to maintaining profitability and institutional sustainability.

The positive relationship also indicates that effective risk management improves organizational efficiency by preventing avoidable losses before they significantly affect financial performance. Rather than functioning solely as a protective mechanism, Enterprise Risk Management creates organizational value through better resource allocation and more informed strategic decisions.

These findings are consistent with the theoretical arguments presented in the thesis, which emphasize that effective risk management enables financial institutions to anticipate uncertainties while improving organizational resilience. The results further reinforce the importance of integrating risk management into daily operational activities rather than treating it merely as a compliance requirement.

Practically, this finding implies that LPD management should strengthen internal control systems, improve credit evaluation procedures, enhance monitoring mechanisms, and establish more systematic risk management practices. Such improvements are expected to reduce non-performing loans and improve overall financial performance.

5.4 The Mediating Role of Risk Management

The mediation analysis demonstrates that Enterprise Risk Management does not mediate the relationship between human capital and financial performance. Accordingly, **Hypothesis 4 is rejected.**

Although Enterprise Risk Management significantly improves financial performance, human capital does not significantly influence Enterprise Risk Management. Consequently, the indirect effect of human capital through risk management becomes statistically insignificant.

This finding suggests that human capital contributes directly to financial performance rather than indirectly through improvements in risk management implementation. In other words, employee competence enhances organizational profitability through better operational performance, customer service, financial management, and organizational efficiency without necessarily affecting formal risk management systems.

From a theoretical perspective, this result indicates that the relationship proposed by the Resource-Based View is primarily direct rather than sequential. Human capital itself functions as a strategic organizational resource capable of improving financial performance without requiring mediation through another organizational capability.

The absence of mediation also suggests that Enterprise Risk Management within Village Credit Institutions may be shaped primarily by institutional governance, regulatory compliance, and managerial policies rather than individual employee competence.

5.5 The Moderating Role of Technology Adoption

The empirical findings further reveal that technology adoption does not significantly moderate the relationship between human capital and financial performance. Therefore, **Hypothesis 5 is rejected.**

This result indicates that technology adoption does not strengthen the contribution of human capital to financial performance. Although digital technology has been introduced within many Village Credit Institutions, its implementation has not yet generated sufficient organizational transformation to amplify the economic benefits derived from employee competence.

One possible explanation is that technology implementation among LPDs remains relatively uneven. Some institutions have successfully adopted computerized accounting systems, digital transactions, and integrated information systems, whereas others continue to rely predominantly on conventional administrative procedures. Such variation reduces the overall moderating effect of technology adoption.

The findings also indicate that technology functions primarily as a supporting tool rather than a substitute for employee competence. Employees remain the principal drivers of organizational performance, while technology merely facilitates operational activities. Consequently, improvements in financial performance continue to depend largely on human resource quality.

From the perspective of the Technology Acceptance Model (Davis, 1989; Davis et al., 1989), successful technology adoption depends not only on technological availability but also on users' perceptions regarding usefulness and ease of use. Therefore, limited technology utilization may reflect insufficient employee acceptance, inadequate training, or organizational readiness rather than technological limitations themselves.

This finding also suggests that digital transformation within Village Credit Institutions remains in a transitional stage. Investments in digital infrastructure alone are unlikely to improve organizational performance unless accompanied by continuous employee training, organizational learning, and strategic change management.

Synthesis of Findings

Overall, the findings indicate that **human capital remains the primary strategic resource influencing financial performance**, consistent with the Resource-Based View. While **risk management contributes directly to financial performance**, it does not serve as the mechanism through which human capital creates value. Furthermore, **technology adoption has not yet become a strategic capability capable of strengthening the impact of human capital**, suggesting that digital transformation within Village Credit Institutions is still evolving.

These findings contribute to the strategic management literature by demonstrating that the effectiveness of organizational resources depends not only on their availability but also on the institutional context in which they are utilized. In indigenous financial institutions such as Village Credit Institutions, organizational performance continues to depend primarily on employee competence, community trust, and governance quality rather than on technological sophistication alone.

6. Theoretical Implications

This study contributes to the strategic management and financial management literature by extending the application of the **Resource-Based View (RBV)** and the **Technology Acceptance Model (TAM)** within the context of indigenous microfinance institutions. While previous studies have predominantly focused on commercial banks, manufacturing firms, or publicly listed companies, this research demonstrates that these theoretical perspectives remain relevant in explaining organizational performance within Village Credit Institutions (LPDs), which operate under a distinctive socio-cultural and customary governance system.

First, the findings reinforce the fundamental proposition of the Resource-Based View (Barney, 1991), which argues that sustainable competitive advantage originates from valuable, rare, inimitable, and non-substitutable organizational resources. The significant positive effect of Human Capital on Financial Performance confirms that employee competencies, knowledge, experience, and organizational skills constitute strategic intangible assets capable of generating superior financial outcomes. This evidence extends the applicability of RBV beyond conventional business organizations to indigenous financial institutions operating within community-based governance structures.

Second, although Enterprise Risk Management significantly improves Financial Performance, the absence of a significant relationship between Human Capital and Risk Management suggests that organizational capability cannot be explained solely by employee competence. Rather, effective risk management appears to require complementary organizational resources, including governance quality, institutional policies, leadership commitment, and internal control systems. This finding enriches the RBV literature by emphasizing that organizational capabilities emerge from the interaction between human resources and institutional processes rather than from individual competencies alone.

Third, the insignificant moderating effect of Technology Adoption provides an important contribution to the Technology Acceptance Model. While TAM proposes that technology utilization enhances organizational performance through users' perceptions of usefulness and ease of use (Davis, 1989; Davis et al., 1989), the present findings indicate that technology adoption alone does not necessarily strengthen the contribution of human capital to financial performance. This suggests that technological infrastructure must be accompanied by organizational readiness, continuous learning, and effective change management before it can become a strategic organizational capability.

Overall, this study demonstrates that the effectiveness of strategic organizational resources depends substantially on institutional context. Within Village Credit Institutions, organizational performance continues to rely primarily on human capital and governance quality, whereas technology functions mainly as an enabling resource rather than a primary driver of competitive advantage.

7. Practical Implications

The findings provide several practical implications for managers of Village Credit Institutions, policymakers, and local governments seeking to strengthen the sustainability of community-based financial institutions.

First, the positive contribution of Human Capital to Financial Performance highlights the importance of continuous investment in employee development. LPD management should prioritize professional education, technical training, financial certification, digital literacy, leadership development, and organizational learning programs. Improving employee competencies is expected to increase operational efficiency, service quality, and organizational profitability.

Second, although Human Capital does not significantly influence Enterprise Risk Management, Risk Management itself significantly improves Financial Performance. Therefore, LPD managers should strengthen institutional governance by establishing standardized risk management procedures, improving internal control systems, enhancing loan monitoring mechanisms, and regularly evaluating operational risks. Risk management should become an integral component of strategic planning rather than merely a regulatory requirement.

Third, the insignificant moderating effect of Technology Adoption suggests that digital transformation alone cannot guarantee superior organizational performance. Consequently, investments in digital infrastructure should be accompanied by employee training, organizational readiness, and effective technology management. Managers should ensure that technological innovation is fully integrated into daily operational activities and aligned with organizational objectives.

Fourth, local governments and the Village Credit Institution Development Agency (LP-LPD) should continue supporting digital transformation by providing technical assistance, standardized information systems, professional development programs, and institutional supervision. Such initiatives will improve the long-term competitiveness and sustainability of Village Credit Institutions in an increasingly digital financial environment.

8. Conclusion

This study examined the influence of Human Capital on Financial Performance, with Enterprise Risk Management serving as a mediating variable and Technology Adoption acting as a moderating variable among Village Credit Institutions in Badung Regency, Bali.

The empirical findings demonstrate that Human Capital has a positive and statistically significant effect on Financial Performance. This result confirms that employee competencies, knowledge, and professional capabilities remain fundamental determinants of organizational profitability within indigenous microfinance institutions.

The study further reveals that Enterprise Risk Management significantly improves Financial Performance, indicating that effective management of organizational risks contributes directly to operational efficiency and institutional sustainability. However, Human Capital does not significantly influence Enterprise Risk Management. Consequently, Enterprise Risk Management fails to mediate the relationship between Human Capital and Financial Performance.

Furthermore, Technology Adoption does not significantly moderate the relationship between Human Capital and Financial Performance. This finding suggests that the implementation of digital technology within Village Credit Institutions has not yet reached a level capable of amplifying the contribution of employee competence toward organizational performance.

Overall, the findings reinforce the Resource-Based View by confirming that Human Capital represents the most valuable strategic organizational resource in improving financial performance. However, the results also indicate that organizational sustainability depends not only on employee competence but also on effective governance, institutional capability, and organizational readiness to manage technological transformation.

9. Limitations and Future Research

Several limitations should be acknowledged when interpreting the findings of this study.

First, the study focuses exclusively on Village Credit Institutions located in Badung Regency, Bali. Although Badung represents one of the largest and most developed LPD networks in Indonesia, the findings may not be fully generalizable to Village Credit Institutions operating in other regencies or provinces with different economic, institutional, and socio-cultural characteristics.

Second, the observation period covers only three years (2022–2024). A longer observation period may provide greater insight into the long-term dynamics of organizational performance, technological transformation, and risk management practices.

Third, Technology Adoption was measured primarily through institutional implementation rather than employee perceptions of technology utilization. Future studies may incorporate additional constructs from the Technology Acceptance Model, such as **Perceived Usefulness**, **Perceived Ease of Use**, **Behavioral Intention**, and **Actual System Use**, to obtain a more comprehensive understanding of technology adoption within Village Credit Institutions.

Finally, future research should consider integrating additional organizational variables such as corporate governance, organizational culture, innovation capability, leadership, digital transformation readiness, and knowledge management. Examining these variables simultaneously may provide a more comprehensive explanation of organizational performance within indigenous financial institutions.

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