**THE ROLE OF MCS INTEGRATION WITH ERM IN CONTROLLING AND MANAGING RISK FOR INDONESIAN FINTECH COMPANY**

#### **ABSTRACT**

The study of MCS integration with other elements especially in controlling and managing the risk brings new forms to the MCS literature particularly integration between the MCS with the ERM and its integration effects on firm performance. Using two MCS dimensions i.e., diagnostic control system and interactive control system integrated with ERM components the study investigates the extent of the integration between the MCS and the ERM and its effect on firm performance. The study used FinTech companies in Indonesia as a sample of study with 132 out of 159 FinTech companies in Indonesia study finds there is integration between MCS and the ERM component. However, the study also finds that the integration between MCS and ERM is somewhat lacking to a certain extent. This is attributed to contextual factors as well as the specific tasks and processes involved in the integration between MCS and the ERM components. Nevertheless, the lack of integration between MCS and ERM does not impact FinTech performance. Instead, all aspects of MCS integrate with the components of ERM and affect FinTech performance. The study contributes to giving an extensive view of how the integration of MCS with ERM leads to firm performance both theoretically and practically

***Keywords***: Management control system, Enterprise risk management, FinTech

### **INTRODUCTION**

A new form of MCS has emerged within the domain of MCS focusing on integrating MCS with other components in the organization i.e., enterprise risk management (ERM). ERM is a well-known strategic risk management approach with provides a holistic view toward risk management (Callahan & Soileau, 2017). Integrating MCS and ERM is a novel approach, as they have traditionally been treated as separate entities with different goals and procedures. Nevertheless, there is an increasing acknowledgment of the necessity of integrating these two systems to better organizational performance and effectively tackle risks more comprehensively (Adiputra et al., 2020). According to system theory, organizations are complex entities consisting of interconnected and interdependent components. These components involve a variety of systems, processes, and individuals within the organization to achieve organizational objectives and ensure the smooth functioning of the entire operation (Hewege, 2012). Moreover, the fundamental analysis involving MCS and ERM that ERM has a vital function in monitoring and overseeing the actions of the board and directors. ERM is integral to the organizational control framework as it involves the identification, assessment, and management of risks that could impact the achievement of organizational objectives. It ensures that risks are systematically recognized and addressed in alignment with the organization’s goals (Adiputra et al., 2020; Silva & Fernandes, 2019). On the other hand, MCS is primarily concerned with the planning, coordination, and control of operational activities within the organization (Braumann, 2018; Braumann et al., 2020; Su et al., 2017). While ERM focuses on identifying and mitigating risks to safeguard organizational objectives, MCS supports effective implementation of strategies through operational oversight and performance management. Together, ERM and MCS ensure a comprehensive approach to risk management and organizational control.

Despite the increasing interest in integration, there is a lack of theoretical foundations and practical guidelines to support organizations in this endeavor. Existing literature often looks at risk management from a one-sided perspective, focusing either only on ERM or only on MCS (Adiputra et al., 2020). This single-approach method has limitations because risks are interconnected and can affect different parts of an organization. Decisions made in MCS can influence risk levels, and at the same time, risk events can affect how well MCS works. To address this, there is increasing interest in combining ERM and MCS to improve risk management and boost overall organizational performance. Furthermore, since many studies looks at risk management from a one-sided perspective and lack considering their interrelationships and the systemic nature of the integration process, thus, it needs a systematic and comprehensive framework that takes into account to guide the integration of MCS and ERM. System theory provides a holistic perspective by emphasizing the interdependence and feedback loops among various elements within a system. By applying system theory principles to the integration of MCS and ERM, organizations can gain a deeper understanding of the dynamic interactions between these two functions and develop strategies to optimize their joint effectiveness. There are two main modes of control discussed in the MCS literature namely the diagnostic control system and the interactive control system (Bisbe et al., 2019; Su et al., 2017). The diagnostic approach focuses on monitoring outcomes to ensure the fulfillment of predetermined organizational goals, while the interactive approach promotes communication and interaction to foster creativity and innovation (Su et al., 2017). In addition, the diagnostic and interactive approaches to using controls coexist and operate concurrently in order to fulfill distinct objectives (Widener, 2007). On the other hand, ERM is risk management approach that provide holistic view toward risk management. Thus, it has the component to manage all firm risks that confronting in the organization. ERM is published by COSO (Prewett & Terry, 2018) and has been updated few times and the latest update was ERM-COSO framework 2017. ERM-COSO 2017 framework has dept at the expenses of clarity. In addition, this, the update model is become complex, difficult to understand and little operational guidance is provided (Prewett & Terry, 2018). Instead of using the ERM-COSO 2017 framework, this study employs the ERM component practice proposed by Braumann (2018). The ERM component approach by Braumann (2018) has been tested and has identified empirical patterns of ERM practice, making it a reliable choice for this study. There are five component ERM practices that Braumann, (2018) constructed namely organizational environment, risk awareness, strategy integration, reporting and risk assessment. The study provides the synergy and increase value of ERM framework that practice in the organization.(Braumann, 2018).

Integrating MCS levers of control and ERM helps organization build comprehensive framework that enables them to proactively identify, evaluate, and mitigate risks, ultimately contributing to the achievement of optimal firm performance especially in FinTech company since this industry has recently become focus of considerable due to it transforms financial service landscape (Adiputra et al., 2020; Putri et al., 2019). FinTech companies leverage technology to offer efficient, customer-centric financial solutions through innovations such as online payment systems, peer-to-peer lending platforms, and blockchain applications (Putri et al., 2019; Setiawan & Maulisa, 2020). While these technological advancements offer substantial opportunities for growth and enhanced service delivery, they also introduce a range of unique challenges. Indonesian FinTech company operates highly regulated by OJK (Otoritas Jasa Keuangan) Indonesia and BI-Indonesia (Central Bank of Indonesia) as well as operates in dynamic environment that presents a spectrum of risks, including those related to technological security, regulatory compliance, and operational efficiency. To navigate this complex landscape, FinTech companies in Indonesia must embrace a holistic approach to governance and risk management. This involves implementing robust risk management practices that are designed to identify potential threats, assess their impact, and develop strategies to mitigate them effectively (Batunanggar, 2019). A well-structured ERM component practice that proposed by Braumann, (2018), supported by the MCS levers of control (Adiputra et al., 2020), ensures that these companies can not only manage risks but also align their risk management strategies with their strategic objectives, thereby contributing to optimal firm performance. The integration of MCS levers of control such as diagnostic control systems, and interactive control systems within an ERM components allows FinTech companies to build a resilient risk management infrastructure. This infrastructure helps organizations stay ahead of potential risks and adapt to changes in the regulatory and technological environment, ultimately ensuring the sustainability and success of their business operations. By adopting a comprehensive and proactive risk management approach, FinTech companies can achieve a balanced approach to growth and compliance, thereby enhancing their ability to deliver innovative financial services while maintaining high standards of governance and risk management. In addition to this, the study would like to investigate the integration MCS levers of control with the ERM that lead to FinTech performance. furthermore, to achieve the research objective, two research question arise namely to what extent the integration MCS with ERM manage and control the risk and what extent the integration MCS and ERM affect to FinTech performance. The study contributes to both theory and practice by providing comprehensive understanding on how the integration the MCS levers of control with ERM component practice. Furthermore, it gives extensive view of how the integration MCS with ERM lead to FinTech performance. At the same time, the study develop instrument to measure the integration between MCS levers of control and ERM that affect to FinTech performance.

### **LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

**Management Control System and Enterprise Risk Management**

Management control encompasses the formal procedures and structures established within an organization to direct and regulate its operations, oversee performance, and accomplish organizational goals. MCS encompasses a variety of tools, techniques, and practices that aid in the planning, coordination, communication, and evaluation of activities and outcomes. (Chenhall et al.,2010; Ferreira and Otley, 2009; Otley, 2004; Broadbent, 2015, Alfiandri, 2012; Chapman & Kihn, 2009; Malmi & Brown, 2008; Simons 2000; Widener 2007). According to management control literature there are different management control framework that have been proposed by the researcher such as, Simons’ (1994) levers of control, Malmi and Brown’s (2008) management control package and Adler and Borys’ (1996) enabling and coercive models of control are name of few which depends on their control mechanism focus. However, this research relies on Simons’ (1994) levers of control due to this framework is predominant control framework that depict control system practice in the organization. Simon (1994) control framework proposed four modes of controls i.e., belief systems, boundary systems, diagnostic systems and interactive systems. Role of belief systems and interactive systems are used to encourage innovative behaviour while, role of boundary systems and diagnostic control systems are used to ascertain that people behave according to pre-established rules and plans, hence, the main stream of levers of controls falls to diagnostic control system and interactive control system (Braumann et al., 2020; Su et al., 2017).

Integration MCS levers of control with other system or approach is new form in the management control literature especially in controlling and managing the risk. MCS primarily focuses on controlling risk within functional areas in the organization. Thus, it involves establishing control systems, processes, and procedures to monitor and manage risks within those areas. the objective of MCS to ensure that activities within those areas are aligned with organizational objectives and desired outcomes. However, when management control becomes tighter and based on a specific predictive model, decision-makers have limited autonomy to tackle matters, particularly in turbulent and uncertain times (Rana et al., 2019), In addition, risk supposedly be managed. Through ERM approach, the risk is managed with comprehensive approach that integrated with organization’s strategic decision-making process. the ERM provides the component to manage all firm risks that confronting an organization. Study uses ERM components practice that propose by Brauman (2018). This is because, that component have been tested empirically and provide common practice of risk management in the organization rather than 2017 ERM COSO component which has expenses of clarity more complex and difficult to understand than 2004 framework (Braumann, 2018; COSO, 2017; Prewett & Terry, 2018). There are five ERM’s component that proposed by Braumann (2018) namely, Organizational environment, risk awareness, strategic integration, risk assessment and reporting. Brauman (2018) defines the organizational environment is the formal expectations and process set by the top of the firm to framework ERM implementation. He argued that when implementing the ERM, the management selects an international framework to guide their practice in establishing an internal risk oversight environment. Meanwhile. risk awareness (Braumann et al., 2020) is the outcome of all employees, including top management, collectively considering and evaluating how their behavior and actions are linked to the causes and consequences of potential risks to the company. Cultural components are essential for effective risk management and form the basis for successful implementation of ERM in an organization. Strategic integration as the third is component process that ensures the incorporation of risk information into strategic planning and decision-making. He argued that effective ERM programs should assist employees in handling risk more effectively by not only mitigating negative risks but also identifying opportunities throughout the organization for pursuing positive risks. Risk assessment is the fourth component ERM that involves the formal process of identifying and evaluating risks. The component utilizes mathematical models and techniques to recognize, measure, and control risk exposure. The reporting component of ERM is the final practice that establishes a formal standard for processing, documenting, and communicating risk information within the organization.

Integrate the ERM with the MCS would enhance risk management and control (Adiputra et al., 2020; Rad, 2016). Thus, practically, the management often utilize a combination of ERM and MCS to control and manage the risks effectively. This practice is in line with system theory that organizations as complex systems composed of interconnected parts that interact with each other and their environment (Hewege, 2012) thus led to Firm performance. For instance, integration diagnostic and interactive control system and organizational environment. When the management implement ERM, the management often choose international standard of risk management to guide their practices in creating an internal risk oversight environment i.e., COSO’s ERM framework (Braumann, 2018). Standards and procedures for risk management are established and formulated by the board of management. As a result, performance measures are developed by top management to oversee the board's efforts to manage and control risks. Furthermore, the ability of the board of management to identify deviations from predetermined standards and procedures relating to risk management tasks enables them to implement corrective measures. Moreover, their expectations are fulfilled with regard to the organizational environment that they establish and shape. Furthermore, employ consistent performance data and discernment to assess the efficacy of their risk management methodology and identify opportunities for enhancement. This is role of diagnostic of the MCS that monitor outcomes and correct any deviation from pre-set performance standard therefore, formal expectation and process that have set by top management to establish corporate framework is achieved (Braumann, 2018). Meanwhile, frequent dialog and sharing information between top and low management will reduce environmental uncertainty (Bisbe et al., 2019; Su et al., 2017). Through encouraging employees to share their insights, concerns, and observations related to risks, organizations may tap into a collective intelligence that facilitates the early detection of potential risks. In addition, incorporating management participation in decision-making processes that involve subordinates will facilitate effective risk control and management. Thus, the following hypothesis is

*H1a: Diagnostic control system is positively integrated with the ERM organizational environment*

*H1b: Interactive control system is positively integrated with the ERM organizational environment*

Risk awareness is a cultural component that is not documented in any regulation or policy, but is embedded in the employees’ risk-thinking (Lam 2014; Braumann, 2018). Risk-aware people proactively identify the key risks for the company, seriously think about the impact of the risk they are responsible for; Hence, risk awareness is the result of all employees sharing and reflecting on how their behavior and actions are associated with causes and outcomes of potential risks to the firm (Braumann, 2018). There are two ways that can strengthen risk awareness i.e., top down and bottom-up approach. Top-down approach is the approach control and monitor of the employee behaviour, also include the communication of commitment and behavioural expectations with respect to risk management. For instance, employees are encouraged to actively identify and report potential risks. This can be achieved by incorporating risk-related checklists and guidelines and report through formal reporting channel. In addition, the management able to control and monitor the firm risks. Bottom-up approach on the other hand, which is encouragement of communication and escalation of risk issues. The two ways approach is similar vein concept of diagnostic control and interactive control. Diagnostic control involves setting standards and monitoring performance, while interactive control emphasizes communication, learning, and adaptation (Su et al., 2017) . By utilizing a combination of top-down and bottom-up approaches, organizations can foster a risk-aware culture that enables effective risk management.

Interactive control involves interpreting and discussing budget data and performance measures in face-to-face meetings between top management and employees (Mundy, 2010, (Braumann et al., 2020). Furthermore, the interactive use of budgets and performance measures provides an especially well-suited forum for top management to set the tone, walk the walk, and communicate their risk attitude to employees, thereby increasing risk awareness (Braumann, 2020). Interactive control is expected to improve the effectiveness of top-down tone, which has led to risk awareness and firm performance. On the other hand, the use of diagnostic control strengthens the effect of top-down tone on risk awareness because its monitoring nature communicates which dimensions of performance are desired, giving employees a clear sense of which areas to reflect on risk issues (Mundy, 2010, Braumann, 2020). As a result, diagnostic control and interactive control systems expect to raise risk awareness. Thus, the following hypothesis is

*H2a: Diagnostic control system is positively integrated with the ERM risk awareness*

*H2b: Interactive control system is positively integrated with the ERM risk awareness*

Risk information is important for the top management to make strategic planning and decision making, control and monitor the employee need to be implemented. In addition, the middle managers provide risk information for the top management thus, top managements have good insight and understand the potential risk that they may face. In addition to this, the top management control and monitor the employee behavior from the tasks and only involve in subordinates (unit/department) activities when there are variances between actual and expected outcomes thus, risk information can be used for strategic planning. It is role of diagnostic control system with strategic integration. Meanwhile. when the managers of department provide risk information to the top management, they can communicate about the risk, thus, the top management have views, understand and able to innovate the potential of the risk that they are facing. Thus, it is role of the interactive control that integrate with strategic integration. In addition, the following hypothesis is

*H3a: Diagnostic control system is positively integrated with the ERM strategic integration*

*H3b: Interactive control system is positively integrated with the ERM strategic integration*

Risk assessment is a structured procedure where individuals identify and evaluate potential risks. The top management utilizes quantitative risk measurement to evaluate the risk. This allows the firm to effectively manage and monitor the risk. The management is capable of identifying and assessing the risks that affect business activities. If there is a discrepancy between the risk assessment and the actual level of risk, the management is capable of implementing proactive measures to address the risk. Diagnostic control of management control systems is integrated with ERM of risk assessment to effectively control and monitor risks. Risk assessment necessitates ongoing interaction and communication between top management and all hierarchical levels. Furthermore, top management actively promotes the regular participation of subordinates in decision-making activities, thereby creating an environment of interactive control. The interactive control fosters a collective comprehension of risk, promoting the exchange of information and facilitating the implementation of risk mitigation strategies among various departments within the organization. Furthermore, interactive control systems improve the quality and precision of risk assessments by fostering collaboration and facilitating the exchange of information. Therefore, the hypothesis is

*H4a: Diagnostic control system is positively integrated with the ERM risk assessment*

*H4b: Interactive control system is positively integrated with the ERM risk assessment*

The standards by which risk information is processed, documented, and disseminated throughout the organization constitute reporting. The emphasis of the board of directors on effective risk monitoring, including reporting procedures, stems from the fact that management is answerable to the board (Braumann, 2018). Furthermore, reporting serves as an information tool utilized by management to assess and monitor risks, while also providing feedback to facilitate corrective actions in the event of deviations. The implementation of quantitative risk assessment techniques and the regularity with which risks are reported are critical elements in enabling management to effectively manage and assess risks. It aids the impact management initiative as it is the method by which management controls risk (Paape and Spekle', 2012). For example, the management implements key risk indicators that are in line with the organization's objectives. Therefore, the management routinely reviews the key risk indicator report in order to detect possible risks. Perform routine risk assessments utilizing standardized methods. Utilize the outcomes of these evaluations to revise risk reports and monitor the evolution of risk profiles over a period of time. Integration of the diagnostic control system with ERM reporting.

However, sometimes ERM systems produce awkward, incomplete, and complex information objects (Tekathen & Dechow, 2013). It is therefore essential that managers at all levels of the organizational hierarchy interact and communicate. In order to reduce the ambiguity associated with the reporting of risk information, which is occasionally overly complex and incomplete. Concurrently, generate new ideas and initiatives to control and manage the risk through interaction and communication. Encourage open communication channels between risk managers, executives, and operational teams to facilitate timely reporting of risks and enable prompt decision-making. Thus, it ensures that risk reporting aligns with strategic objectives and addresses the concerns of all relevant to all parties. This way is interactive control system integrate with ERM reporting. By integrating an interactive control system with ERM risk reporting, organizations can facilitate real-time discussions about risk identification, assessment, and response strategies, leading to more effective risk reporting and decision-making. Thus, it can also promote innovation and generate new ideas and initiatives (Ferreira and Otley’s (2009); Silva & Fernandes, 2019). In addition, the following hypothesis is

*H5a: Diagnostic control system is positively integrated with the ERM reporting*

*H5b: Interactive control system is positively integrated with the ERM reporting*

**MCS and ERM affect to FinTech performance**

As technology advances and disrupts traditional financial processes, organizations are confronted with the task of efficiently incorporating technological innovations into their risk management strategies (Brown et al., 2019; Widyastuti & Affan, 2022; Wiesche et al., 2015). An effective method for dealing with this issue is the integration of MCS with the ERM. It is in line with system theory that that organizations are complex systems made up of interconnected and interdependent parts. These parts include various systems, processes, and individuals within the organization. to achieve organizational objectives and ensure smooth functioning (Hewege, 2012). Integration diagnostic and interactive control system with the ERM components enables organizations in the FinTech sector to efficiently handle and reduce risks, synchronize their strategies with risk management approach, and improve their overall performance. Fintech refers to companies that utilize technology to operate outside the confines of traditional business models for financial services. These companies aim to revolutionize the way financial services are provided by leveraging internet communication and automated information processing (Milian et al., 2019). Hence, it is imperative for companies to safeguard their products and services from potential risks. Furthermore, risk cannot be better anticipated if the risk through the company's risk management system cannot run without a management control system pattern that plays a role in prioritizing routine procedures at the company through existing information so as to align all interests of both individuals and companies in order to achieve its main goal of achieving the company's performance (Adiputra et al., 2020). In addition, The integration between MCS and the ERM would create synergetic framework that not only enhances the organization's risk management capabilities but also drives its overall performance (Adiputra et al., 2020; Lueg & Knapik, 2016; Rad, 2016; Shin & Park, 2017; Wiesche et al., 2015). Such benchmarks for FinTech performance as ROA, ROE and operational performance i.e., cost efficiency and operating profit, financial service quality, employee work efficiency (Putri et al., 2019). Thus, the following hypothesis is

*H6: MCS levers of control is integrated with ERM components that affect to FinTech Performance*

**Figure.1:** Summary the theoretical framework

MCS

(Diagnostic control System & Interactive Control System

FinTech Performance

ERM Components

### **METHODOLOGY**

* 1. **Sampling and data collection**

The data collection and hypothesis testing for this study were conducted using a survey questionnaire that specifically targeted to Indonesian FinTech companies which in operating in various types of FinTech. In Indonesia, there are six types of FinTech companies: Peer to Peer (P2P), Crowdfunding, risk management investment, payment, clearing & settlement, and market aggregator. The list of FinTech companies provided by Otoritas Jasa Keuangan (OJK) Indonesia was used as the sampling frame for this study. The sample method employed was population sampling, as the number of FinTech companies registered with Otoritas Jasa Keuangan (OJK) was relatively small. A total of 159 FinTech firms are registered with the OJK-Indonesia, and this number varies due to ongoing monitoring and evaluation conducted by the Otoritas Jasa Keuangan (OJK) in Indonesia. Data was gathered from June until August 2023 through the utilization of survey questionnaires that were self-administered, sent via mail, and distributed via social media platforms such as WhatsApp. The questionnaire was created using Google Forms, allowing respondents to access and complete it. A questionnaire was distributed to 159 FinTech companies, and 132 of them responded to the questionnaire. The researcher personally visited and collected questionnaires from a select number of FinTech companies located in the Jabodetabek area (Jakarta, Bogor, Tangerang, Depok, and Bekasi). For the remainder, the questionnaire was distributed via mail and social media platforms such as WhatsApp. Each FinTech company was provided with a series of questionnaires, which were directed towards the top management and operational managers. These individuals were chosen as suitable respondents because they are directly involved in the implementation of control measures and the management of the firm's risks. Furthermore, they possess the highest level of expertise in relation to FinTech business operations.

* 1. **Measurement of construct and data analysis**

Management control system consist of diagnostic and interactive control system were measured by items adapted from previous literature i.e., Henri (2006) and Widener (2007), Sophia.su et.al., (2017), Bisbe et.al., (2019) and slightly modification that relate to ERM. There are four indicators to measure diagnostic control namely, track progress toward goals and monitor the risk, compare the outcome with expectation of control the risk, review key measure of the risk and identify significant exceptions from expectations and take appropriate actions in control the risk. Similar with diagnostic control system, interactive control system was measured by items adapted from Henri (2006) and Widener (2007), Sophia.su et.al., (2017), Bisbe et.al., (2019). There are five indicators namely, top management interpret risk information from risk assessment, top management put little day to day attention on the ERM, operating managers are involved infrequently and on exception basis with ERM, top management pays day to day attention to ERM and Operating managers are frequently involved with ERM. The respondent required ask to evaluate the extent management implement the diagnostic control and interactive control system using a five-point likert scale ranging from 1 = small extent to 5 = large extent.

Measurement of the ERM on the other hand which consists of five components namely organizational environment, risk awareness, strategic integration, risk assessment and reporting are adopted from Brauman. E (2018), Brauman. E, et.al., (2020) and each components has their own indicator. using a five-point likert scale ranging from 1 = does not apply to 5 = fully applied the respondent were aske the implementation of ERM in their organization. Organizational environment indicator is risk management task and responses documentation. Risk awareness indicators is risk management responsibility, top risk awareness, employee risk awareness, influence on process and risk appetite statement. Strategic integration indicator is targeting system, corporate planning KPI’s and early indicator. Risk assessment indicator is plausibility check, risk register, quantitative evaluation, interdependencies, aggregation and amount of damage. Reporting indicator is standardized, tolerance limit, risk documentation, top management reporting, standardize reporting. Study’s dependent variable is FinTech performance which has six indicators i.e., financial service quality, employee work efficiency, ROI, ROA, cost efficiency, operating profit.

The study employed PLS-SEM for data analysis as this approach is used to develop new theoretical models and frameworks. Thus, it gives the novelty of this topic be explored. Hierarchal model of testing i.e., higher order construct used in the study due to complexity interrelationship between observed and latent variable (Ringle et al., 2019). Hair et al., (2018) stated that let the study model a construct on a more general dimension (called a lower-order component) and its more specific subdimensions (called higher-order components). In this way, they go beyond the way we usually think about constructs, which is based on a single level of abstraction. There are, however, people who say that using higher-order constructs in this study makes it possible for more theoretical parsimony and less model complexity. Furthermore, the study employs a repeated indicators approach with a reflective-reflective model because lower-order constructs are themselves reflectively measured constructs that can be distinguished but are correlated. Lohmoller (1989) stated that this model name as ‘hierarchical common factor model’, where the higher order construct represents the common factor of several specific factors (Becker et al., 2012). In addition, two stages approach were used in the study (Sarstedt et al., 2019). The first stage was an assessment on the measurement model to see if the model can be used for later analyses. In the second stage is analysis structural model. That approach is applied in the lower order and higher order. In addition, the threshold should be achieved for both measurement and structural model test.

### **RESULT ANALYSIS**

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#### **Profile Respondent**

The study respondent consists of 132 out of 154 FinTech company in Indonesia. Table 1 shows the respondent rate for each category of FinTech that registered in the Otoritas Jasa Keuangan (OJK-Indonesia) and shows that peer to peer (P2P) is the highest respondent with 43.2%, followed by payment, clearing and settlement category with 33.3%, market aggregator category with 10.6%, crowdfunding category 8.3% and the remain is investment risk management with 4.5%. P2P is a platform-based funding service that provide by company serve to those who are underserved or excluded by the traditional banking system. P2P lending helps individuals and small businesses access credit and loans that would otherwise be difficult to obtain.(Batunanggar, 2019, Widyastuti & Affan, 2022). Since FinTech emerged in 2006 (Nizar & Afdi, 2020), the majority FinTech company established 2 until 5 years (61.4%), followed by the company established 6 to 10 years (18.9%), more than 10 years (11.4%) and less than 2 years is 8.3%. It indicates that many new FinTech companies established quite recently. In term of position, respondent with position of head of department operational or the managers (72.0%) is the most participant than other position, following supervisor (17.4%), director (9.1%) and vice director (1.5%). It shows that position directly involved in the planning and operation of business activities and engage in control and monitor the risks, they are expected to have the knowledge and experiences regarding enterprise risk management implementation in the company. Furthermore, the working tenure of respondent have worked 2 – 5 years with 53%, following less than 2 years with 34.8%, 6 to 10 years with 9.1% and more than 10 years with 3.0%. the respondent who graduated from undergraduate (62.9%) are highest than respondent who have graduated from master graduate (32.6%), Phd (3.0%) and Diploma (1.5%).

**Table 1:** Profile Respondent

|  |  |  |
| --- | --- | --- |
| **Type of FinTech** | *Frequency* | *Percent* |
| Peer to Peer (P2P  Crowdfunding  Investment Risk Management  Payment, Clearing & Settlement  Market Aggregator | 57  11  6  44  14 | 43.2  8.3  4.5  33.3  10.6 |
| **FinTech - Establishment** |  |  |
| Less than 2 Years  2 to 5 Years  6 to 10 Years  More than 10 Years | 11  81  25  15 | 8.3  61.4  18.9  11.4 |
| **Position** |  |  |
| Director  Vice Director  Manager  Supervisor | 12  2  95  23 | 9.1  1.5  72.0  17.4 |
| **Working Tenure** |  |  |
| Less than 2 years  2 until 5 Years  6 until 10 Years  More than 10 years | 46  70  12  4 | 34.8  53.0  9.1  3.0 |
| **Education Background** |  |  |
| Phd  Master  Undergraduate  Diploma | 4  43  83  2 | 3.0  32.6  62.9  1.5 |

#### **Measurement Model Analysis**

There are multiple tests performed in the measurement model of low order. The test examined the variable of MCS i.e., diagnostic and interactive control system are separated entities (Bisbe et al., 2019; Widener, 2007) and the ERM comprise of four key variables, specifically strategy integration, risk assessment, organizational environment, and reporting and risk awareness (Braumann, 2018; Braumann et al., 2020). Several phases of factor analysis were performed and table 2 shows final result of convergent validity that diagnostic of MCS have four items, interactive of MCS has five with each factor is greater than 0.6 and no cross loading exists among the items. Meanwhile, the ERM, organizational environment remains two items, risk awareness remains two items, strategic integration remains three items, risk assessment remain three items and reporting remain three items with each factor are greater than 0.6 and no cross loading exists among the items. Furthermore, the subsequent analysis steps involve assessing reliability after convergent validity determined. Table 2 shows reliability and validity that all of the variables have achieved a reliability of validity larger than 0.5 for Average Variance Extracted (AVE) and greater than 0.7 for Composite Reliability (CR) (Hair et al., 2018). In addition, no measured items eliminated.

**Table 2:** Factor loading & indicator reliability for all dimensions MCS-ERM scale

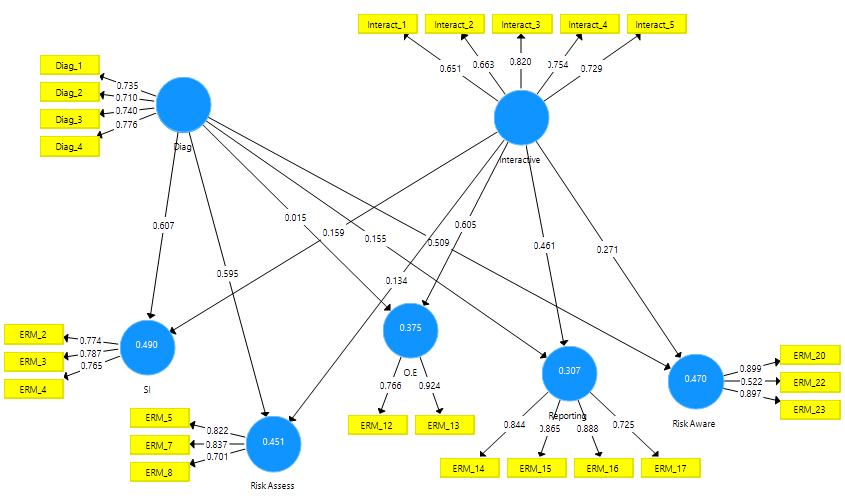
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Item | Outer loading | CR value | AVE value |
| Diagnostic | Diag 1  Diag 2  Diag 3  Diag 4 | .719  .724  .730  .786 | .829 | .548 |
| Interactive | Interact 1  Interact 2  Interact 3  Interact 4  Interact 5 | .656  .667  .819  .749  .723 | .847 | .527 |
| Organizational  Environment | ERM 12  ERM 13 | .767  .924 | .836 | .720 |
| Risk Awareness | ERM 20  ERM 22  ERM 23 | .899  .522  .897 | .828 | .629 |
| Strategic  integration | ERM 2  ERM 3  ERM 4 | .774  .787  .765 | .819 | .601 |
| Risk  Assessment | ERM 5  ERM 7  ERM 8 | .822  .837  .701 | .831 | .623 |
| Reporting | ERM 14  ERM 15  ERM 16  ERM 17 | .844  .865  .888  .725 | .900 | .694 |

In order to pertaining to determination of study model thus, table 3 shows the model is moderate. It shows that the R-square value for organizational environment is 0.375 (37%), indicating the MCS factors i.e., diagnostic control system and interactive control system collectively account for 37% of the variance in organizational environment. This level of association can be considered moderate (Chin, 1998, Ghozali and Latan, 2015). In addition, risk awareness has achieved a score 30% while strategic integration component has attained a score 45%. Moreover, risk assessment component has been evaluated at 47% and reporting has obtained a score 49%. The finding provides empirical evidence that support the propose model indicating a significant relationship between Management Control Systems (MCS) and Enterprise Risk Management (ERM) in the context of FinTech companies.

**Table 3:** Determination of the model

|  |  |
| --- | --- |
| Variable | R. Square |
| Organizational environment  Risk awareness  Strategic integration  Risk assessment  Reporting | .375  .307  .451  .470  .490 |

After evaluating the measurements, the next step is to perform a structural test. The structural phase is essential in determining the ten hypotheses of the investigation at a lower level. The study utilized bootstrapping in PLS-SEM to investigate the relationship between the ERM component of the study and MCS.



**Figure 2**: Partial least squares algorithm reporting path coefficients MCS with ERM

* 1. **Structural Model Analysis**

1. **MCS has integrated with ERM Organizational environment (H1)**

Structural model analysis is performed after the measurement test. Table 4 presents the path coefficient for the examined relationship between the diagnostic control system and the organizational environment, specifically referred to examine the H1a. Furthermore, the observed degree is statistically insignificant at a p-value of 0.875 (p<0.05). In addition, there is negative relationship between diagnostic control system with organizational environment. Contradicted with H1a, H1b has positive relationship between interactive control system with organizational environment. It shows path coefficient p-value 0.000 (p<0.05). thus, H1a is not supported while H1b is supported

**Table 4:** Path Coefficient Diagnostic Control System & Organization Environment

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H1a: Diagnostic control system 🡪 *Org. Environment* | 0.875 | - | Not supported |
| H1b: Interactive control system 🡪 *Org. Environment* | 0.000 | + | Supported |

1. **MCS has integrated with ERM risk awareness (H2)**

Table 5 presents the path coefficient for the examined relationship between the diagnostic control system and risk awareness. Result in table 6 show there is relationship between diagnostic control system with risk awareness with path coefficient p-value 0.000 (p<0.05). it shows that there is positive significant relationship between two variables. Similar with H2a, Table 6 provide result relationship between interactive control system with risk awareness. It shows that path coefficient interactive control system and risk awareness at p-value 0.012 (p<0.05) thus, it is also positive relationship between the variables. In addition, both hypotheses H2a and H3b are supported.

**Table 5:** Path Coefficient Diagnostic Control System & Risk awareness

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H2a: Diagnostic control system 🡪 *Risk awareness* | 0.000 | + | Supported |
| H2b: Interactive control system 🡪 *Risk awareness* | 0.012 | + | Supported |

1. **MCS has integrated with ERM strategic integration (H3)**

H3a examined relationship between the diagnostic control system and strategic integration. Table 6 shows path coefficient with p-value 0.000 (p<0.000). In addition to this, it is statically positive significant relationship between diagnostic control system with strategic integration. Meanwhile, Table 7 also shows path coefficient of H3b with p-value 0.037 (p<0.05). It shows that there is positive significant relationship between interactive control system with strategic integration of ERM. in addition, both hypotheses i.e., H3a and H3b are supported

**Table 6:** Path Coefficient Diagnostic Control System & Strategic integration

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H3a: Diagnostic control system 🡪 *Strategic integration* | 0.000 | + | Supported |
| H3b: Interactive control system 🡪 *Strategic integration* | 0.037 | + | Supported |

1. **MCS has integrated with ERM risk assessment (H4)**

The integration between diagnostic control system with risk assessment is examined in H4a. Table 7 shows path coefficient diagnostic control system with risk assessment at p-value 0.000 (p<0.000). In addition to this, there is positive relationship between diagnostic control system with risk assessment thus, H4a is supported. On the other hand, the interactive control system has negative relationship with risk assessment. It shows also in table 8 that path coefficient interactive control system with risk assessment exceed p-value 0.000 (p<0.127) which mean H4b is not supported

**Table 7:** Path Coefficient Diagnostic Control System & Risk assessment

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H4a: Diagnostic control system 🡪 *Risk assessment* | 0.000 | + | Supported |
| H4b: Interactive control system 🡪 *Risk assessment* | 0.127 | - | Not supported |

1. **MCS has integrated with ERM reporting (H5)**

H5 is last hypothesis examined in the first stage of the study. H5a examined relationship between the diagnostic control system with reporting. Table 8 shows path coefficient diagnostic control system to reporting that exceed p-value 0.05 (p<0.110) which mean there is negative relationship between diagnostic control system with reporting. On the other hand, value path coefficient of interactive control system to reporting is p-value 0.000 (p<0.05). it shows there is positive relationship between interactive control system with reporting. In addition, H5a is not supported when H5b is supported

**Table 8:** Path Coefficient Diagnostic Control System & Reporting

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H5a: Diagnostic control system 🡪 *Reporting* | 0.110 | - | Not supported |
| H5b: Interactive control system 🡪 *Reporting* | 0.000 | + | Supported |

1. **MCS has integrated ERM component** **that affect to FinTech performance (H6)**

Examine the integration between combination MCS and ERM that led to FinTech performance is conducted in the higher order analysis. In addition, a latent variable is scored at a lower order to test the higher-order construct (Becker et al., 2012; Hair et al., 2018; Sarstedt et al., 2019). Furthermore, repeated indicator approach used in the study (Sarstedt et al., 2019). Two dimensions of MCS i.e., diagnostic control system and interactive control system along with five dimensions of ERM i.e., organizational environment, risk awareness, strategic integration, risk assessment and reporting led to FinTech performance. Table 9 shows measurement test with R-square value for FinTech performance 0.397 (40%) and this level is considered moderate (Chin, 1998, Ghozali and Latan, 2015). The result shows that model has significant relationship between combination of MCS and ERM to FinTech performance. Thus, structural test is conducted

**Table 9:** Determination of the model

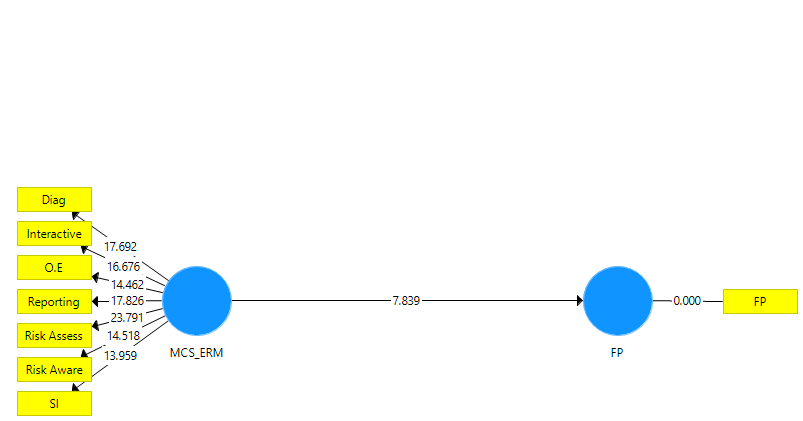
|  |  |
| --- | --- |
| Variable | R. Square |
| FinTech Performance | .397 |

Table 10 shows path coefficient MCS and ERM to FinTech performance with a p-value 0.000. It finds that the relationship between combination of MCS and ERM statically positive significant to FinTech performance. In addition, H6a is supported. Figure 2 shows combination both MCS i.e., diagnostic control system, interactive control system and ERM component i.e., organizational environment, risk awareness, strategic integration, risk assessment and reporting have positive significant relationship with FinTech performance.

**Table 10:** Path Coefficient MCS, ERM and FinTech performance

|  |  |  |  |
| --- | --- | --- | --- |
|  | P-Value | Result | Hypothesis Result |
| H6: MCS & ERM 🡪 FinTech performance | 0.000 | + | supported |

**Figure 3**: Partial least squares algorithm reporting path coefficients combination MCS & ERM with FinTech performance



1. **DISCUSSION AND CONCLUSION**

The investigation of the integration between MCS modes of control and the ERM component, as well as their integrated impact on FinTech performance, reveals that eight hypotheses are supported while three hypotheses are not. Furthermore, a total of 132 out of 145 FinTech companies listed under OJK-Indonesia were selected as the sample for the study in order to investigate eleven hypotheses. Used hierarchal model testing of analysis H1 examined the integration between MCS with ERM organizational environment and finds negative relationship between the variables. The management of FinTech does not often choose international standard of risk management to guide their practices in creating an internal risk oversight environment i.e., COSO’s ERM framework. Standards and procedures for risk management are established as is it. It is supported by Antonius Alijoyo et al., (2021) that management of FinTech in Indonesia implement their own internal ERM rather than use or comply with Indonesian financial technology regulation. The management of FinTech may not have clear understanding the potential advantage to choose international standard of risk management to guide their risk management practice. As a result, performance measures are determined by top management self and oversee the measurement according to their own standard. Antonius Alijoyo et al., (2021) argued that the management of FinTech in Indonesia show no interest in implementing and developing ERM to its full potential thus, unsuccessful implementation of risk management is most likely due to the leader's attitude who does not care about the risk management policies that apply in the company. Furthermore, the ability of top management to identify deviation from predetermined standards and procedures relating to risk management is lacking thus impact to corrective measures that they should take it. In addition, expectation in regards to organizational environment to control and manage the risk are minimized. However, what the unique to control and manage risk in FinTech company in Indonesia is that the management do frequent dialog and sharing information between top and low management in order to reduce environmental uncertainty thus, it is role of interactive control system (Su et al., 2017). The management needs their employee insight, concerns, and observations related to risks in addition to the management able to detect potential risk as early as possible. Incorporating management participation in decision-making processes that involve subordinates will facilitate effective risk control and management. Furthermore, the management expect the employee will have awareness about risks in the FinTech company. thus, H2 finds that the management of FinTech in Indonesia applied top-down approach control and monitor of the employee behaviour by encouraging actively identify and report potential risks through formal reporting channel. At the same time, communication is conducted to handle escalation of risk issues. with p-value 0.012, H2b is supported and finds that interactive control is implemented and improves the effectiveness of top-down tone that led to risk awareness. The interactive control use budgets and performance measures that provided an especially well-suited forum for top management to set the tone, walk the walk, and communicate their risk attitude to employees, thereby risk awareness improved (Braumann, 2020) thus, this way is used by FinTech management of Indonesia.

Meanwhile, The management need risk information from their employee for their strategic planning. Therefore, the management would have good insight and understand the potential risk that impact to their strategic planning (Widyastuti & Affan, 2022). In order to provide valuable risk information for strategic integration purpose, diagnostic control system as well as interactive control system are implemented as it is finds in the H3. Control and monitor employee activities as well as create communication and share risk information between peer to peer and between top management with employee vice versa will improve management view, increase understanding and able to innovate the strategies to face potential risk that they are going to face. In order to provide reliable risk information, risk need to be assessed. Diagnostic control system helps the management able to identify and assess the risks that affect FinTech business activities. If there is a discrepancy between the risk assessment and the actual level of risk, the management is capable of implementing proactive measures to address the risk. However, management of FinTech in Indonesia do not encourage discussion and communication between top management and employee since there is clear structure and procedure of risk assessment thus, it finds in the result of analysis of H4b which is the hypothesis is not supported. The management of FinTech encourage their employee only needs to follow the risk assessment and participate in decision making activities by following risk assessment that have been set up by the management. On the other hand, to controlled and managed the risk, the management of FinTech in Indonesia do not solely rely on risk reporting. This is because the management thinks that reporting provides incomplete and complex information for the management to analyze as it finds in result of analysis of H5a. Reporting serves as an information tool utilized by management to assess and monitor risks (Braumann, 2018), the diagnostic control system focuses on operational performance matric that would not directly align with the risk and compliance reporting requirement of ERM thus impact to data availability and relevance. Rather than used diagnostic control system, interactive control system is more suited for integration with ERM reporting. In order to reduce the ambiguity associated with the reporting of risk information, which is occasionally overly complex and incomplete, managers at all levels of the organizational hierarchy interact and communicate. Concurrently, generate new ideas and initiatives to control and manage the risk through interaction and communication. Encourage open communication channels between risk managers, executives, and operational teams to facilitate timely reporting of risks and enable prompt decision-making. Thus, it ensures that risk reporting aligns with strategic objectives and addresses the concerns of all relevant to all parties. By integrating an interactive control system with ERM risk reporting, organizations can facilitate real-time discussions about risk identification, assessment, and response strategies, leading to more effective risk reporting and decision-making. Thus, it can also promote innovation and generate new ideas and initiatives (Ferreira and Otley’s (2009); Silva & Fernandes, 2019)

FinTech is the company that utilize technology to operate outside the confines of traditional business models for financial services. These companies aim to revolutionize the way financial services are provided by leveraging internet communication and automated information processing (Milian et al., 2019). In addition, it is compulsory for companies to safeguard their products and services from potential risks as it is also the requirement from OJK-Indonesia to FinTech company in Indonesia (Sugeng et al., 2020). Risk cannot be better anticipated if the risk through the company's risk management system cannot run without a management control system pattern that plays a role in prioritizing routine procedures at the company through existing information so as to align all interests of both individuals and companies in order to achieve its main goal of achieving the company's performance (Adiputra et al., 2020) even though, one of role of the MCS either diagnostic control system or interactive control system has less integration (negative relationship) with one of ERM components. For example, the lack of integration between the diagnostic control system and the organizational environment is found, as indicated by the negative relationship between these two variables (refer to table 5). However, this lack of integration does not directly impact FinTech performance; rather, it indirectly affects FinTech performance. The role of diagnostics is necessary to assess the impact of the combination of MCS and ERM on FinTech performance. The absence of a diagnostic control system would result in a deficiency in the ability of other ERM components to effectively control and manage the risks of the firm, thereby impacting the performance of FinTech. The management of FinTech in Indonesia believes that the implementation of a diagnostic control system is necessary. The diagnostic approach to controls involves monitoring outcomes and rectifying any deviations from predetermined performance standards (Su et al., 2017), including controlling and managing the assessed risks as determined by the management. If the management identifies any deviation from the risk assessment, they should promptly implement corrective measures. It is in line with control system theory that one component system in the organization should integrated with others components even though that components are less of the role. This is because, all components that involves in variety of systems, processes, and individuals within the organization to achieve organizational objectives and ensure the smooth functioning of the entire operations (Hewege, 2012) including control and manage the risks. In line with system theory, both diagnostic control system and interactive control system are integrated with the ERM components. In addition, integrating diagnostic control systems, interactive control systems, with the ERM components, FinTech company can develop a comprehensive risk management framework that addresses risks at various levels, from operational to strategic thus, enhances the organization's risk management capabilities and drives its overall FinTech performance (Adiputra et al., 2020; Lueg & Knapik, 2016; Rad, 2016; Shin & Park, 2017; Wiesche et al., 2015)

The results of this study confirm the study objective that there is integration between MCS and the ERM component. However, the study also finds that the integration between MCS and ERM is somewhat lacking to a certain degree. This is attributed to contextual factors as well as the specific tasks and processes involved in the integration between MCS and the ERM components. Nevertheless, the lacking integration between MCS and ERM does not have a negative impact on FinTech performance. On the contrary, all aspects of MCS, combined with the components of ERM, have a positive effect to FinTech performance. In other words, the integration between MCS and ERM has a significant impact on FinTech performance. While the study achieved its objective and provide answers to research questions, it also acknowledges the presence of certain limitation. For instance, the integration of MCS and ERM is influenced by various contextual factors, as well as the specific tasks and processes involved in FinTech business activities. Therefore, the study's conclusions are not generalizable to FinTech firms operating in countries other than Indonesia. Different business environment would bring different extent of the integration between MCS and the ERM in the FinTech company. Moreover, the study on integrating MCS and ERM specifically examines the FinTech industry. Therefore, implementing the integration of MCS and ERM in a different industry would yield different outcomes. Another limitation of the study is that it only focuses on one aspect of MCS, specifically the diagnostic control system and interactive control system that integrate with ERM components. As a result, it does not explore how other types of control dimensions integrate with ERM components. Future research on MCS could explore an additional dimension of MCS that can be integrated with the ERM component. This integration has the potential to introduce novel elements to the existing MCS literature.

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