The Impact of Core Risk Management Principles on the Enterprise Risk Management Processes of Banks: The Evidence of Joint-Stock Commercial Banks in Ho Chi Minh City, Viet Nam

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Enterprise Risk Management (ERM) is an organisation's holistic risk management (RIM) approach. ERM has quickly become the best practice of high-risk institutions like banks. This study aimed to examine the interrelationship of critical principles and components of the ERM framework, namely organisational culture (ORC), risk governance structure (RGS), organisational dynamic capabilities (DYC) and ERM processes. Data were collected using a survey questionnaire. The respondents are managers and experienced officers in the RIM in joint-stock commercial banks (JSCB) in Hochiminh City (HCMC). PLS-SEM is employed with SmartPLS software. The research results show that ORC, RGS, and DYC have a direct and indirect impact on ERM processes. Furthermore, ORC, RGS, and DYC play a mediating role in the relationship between ORC and ERM, between ORC and ERM, and between RGS and ERM, respectively. To manage risk in creating, preserving, and realising value, a business needs to integrate the principles, framework, and processes of RIM. This research makes a valuable contribution to the existing literature by empirically investigating the impact of the RGS, ORC, and DYC on ERM processes. It suggests practical implications for JSCB in HCMC. Limitations of the study are that other crucial factors of the external environment influencing the implementation of ERM by banks have yet to be considered.

Keywords: risk management, risk committee, organisational culture, internal audit, organisational dynamic capability, risk governance structure

INTRODUCTION

Modern corporate organisations face many risks that affect their ability to achieve their strategy and objectives. Organisations must find ways to manage, mitigate, accept, or transfer these risks. Here, ERM exists to help organisations manage risks and keep them safe and in continuity. A comprehensive ERM framework consolidates and improves risk reporting (RIR) so an organisation can implement the proper controls to eliminate or reduce the threat. An effective ERM can also improve human productivity, enhance customer relationships, improve an organisation's compliance posture, and enable organisations to understand the relationship between risk and value creation.

Several ERM frameworks have been developed. Many studies on ERM mainly focus on the application of ERM (Khan et al., 2016), such as the impact of ERM on the value of the business (McShane, 2018), the effect of ERM practices on the organisation performance (Arnaboldi & Lapsley, 2014) and INA participation in ERM (Roslan & Dahan, 2013). Other studies have focused on the effectiveness of ERM (Liebenberg & Hoyt, 2003), but most of these studies were conducted in Western countries (Al-Amri & Davydov, 2016; Nair, 2014), studies done in Asian countries are still very few.

Moreover, ERM is a cultural and a human factor, an essential organisational capital (COSO, 2017; ISO, 2018). Culture affects how people experience an organisation. At the same time, ERM is about capabilities and practices that organisations integrate with strategy-setting and apply when they carry out that strategy, with the purpose of managing risk in creating, preserving, and realising value. Capabilities are conceptualised and categorised as organisational skills and collective learning, core competencies, resource development competence, etc. (Helfat & Peteraf, 2003; Mayer & Salomon, 2006). Practices include an operational RGS that ensures three lines of defence are maintained against potential events that could impact the creation and sustain of the business value of banks. In addition, the core principle of ERM is integration. Integrating RIM into an organisation is a dynamic and iterative process and should be customised to the organisation's needs and culture (COSO, 2017; ISO, 2018). These issues have not been thoroughly researched. Therefore, this study will assess the relationship between ORC, RGS, DYC, and ERM process as integration perspectives in ERM.

In addition, banking is a sensitive sector with a wide range of risks, and most banks have effective ERM frameworks (Jalal et al., 2011). In addition, HCMC belongs to a critical economic region and is the most significant financial centre in Vietnam. Therefore, this study was conducted for JSCB in HCMC.

LITERATURE REVIEW

Enterprise Risk Management

Makomaski (2008) states that ERM is a decision-making principle that deals with change in business goals. As such, the central role of ERM is to integrate all types of risks throughout the business. With the application of ERM, businesses can identify all potential problems that may affect them and know their risk appetite and tolerance (Walker et al., 2003).

According to ISO, ERM is coordinated activities to direct and control an organisation about risk (ISO, 2018). Meanwhile, The Joint Australian Standard/New Zealand Standard states that ERM is a culture or behaviour, processes, and activities that promote the achievement of goals by managing events or potential events that will affect the achievement of corporate goals (AS/NZS, 2004). In addition, COSO (2017) considers ERM to be the culture, capabilities, and practices integrated with strategy-setting and its performance that organisations rely on to manage risk in creating, preserving, and realising value.

Previously, with a "silo" approach, RIM was not integrated with strategic planning and performance. ERM is an approach with effective RIM practices and processes (Yazid et al., 2012). Processes include all parts and units at all levels within an entity. ERM can increase shareholder value and provide a critical source of competitive advantage (Bowen et al., 2006).

Enterprise Risk Management Process

Managing risk is based on principles, framework, and process. The process involves the systematic application of policies, procedures and practices to the activities of communicating and consulting, establishing the context (scope, purpose, context, criteria) and assessing, treating, monitoring, reviewing, recording and reporting risk (ISO, 2018).

Scope, Purpose, Context, Criteria (SPC)

Organisations should understand the internal and external environment and establish criteria based on company priorities, objectives, and policies, which need to be reevaluated throughout the implementation process and amended if necessary. Establishing the scope, context, and criteria is the first of the eight RIM steps where the objectives and influences of the RIM process are defined.

Risk Identification

The goal of risk identification (RID) is to understand what is “at risk” in relation to the organisation's explicit and implicit goals and to create a comprehensive risk profile based on threats and events that may prevent, impair, delay, or enhance the achievement of the goals. RID allows businesses to prepare for potentially harmful events and mitigate their impact before they occur. According to COSO and ISO, RID is a crucial element of ERM.

Risk Analysis

The purpose of risk analysis (RIA) is to comprehend the nature of the identified risk and its characteristics. RIA activity involves a detailed consideration of uncertainties, sources, causes, consequences, events, scenarios, controls, and their effectiveness. RIA should consider factors such as (i)the likelihood of events and consequences, (ii) the nature and magnitude of consequences, (iii) complexity and connectivity, (iv) time-related factors and volatility, (v) the effectiveness of existing controls; and (vi) sensitivity and confidence levels.

Risk Evaluation

Risk evaluation (RIE) is the comparison of the magnitude of each risk and ranking them according to importance and consequences. RIE determines the tolerability of each risk. Tolerability assists in determining which risks need treatment and their relative priority by comparing the severity of the risk against the level of risk you are willing to accept. The RIE process should calculate risk profiles by appropriately aggregating analysed risks and applying the risk criteria.

Risk Treament

The purpose of risk treatment (RIT) is to ensure that all identified risks are addressed in the form of controls that help the organisation prevent potential losses related to strategy, operations, reporting and compliance (COSO, 2004). Responding to risk can be viewed in terms of four primary responses – mitigating, accepting, transferring, or avoiding. RIT is an ongoing process where individual risk treatments are assessed to determine if they are adequate to bring the residual risk levels to a tolerable or appropriate level. The remaining level of risk retained should be within the risk appetite (ISO, 2018).

Recording and Reporting

The RIM process is most effective when well-documented and shared. It may be included in formal risk reports to be recorded and published internally and externally as appropriate. It should also be used as input to reviews of the whole RIM framework. Key objectives of recording and reporting include (i) Communicating RIM activities and outcomes, (ii) Informing corporate planning and decision-making, (iii) Improving RIM activities, and (iv) Assisting interaction with stakeholders.

Monitoring and Review

Key objectives of risk monitoring and review include (i) detecting changes in the internal and external environment, (ii) identifying new or emerging risks, (iii) ensuring the continued effectiveness and relevance of controls and the implementation of treatment programs, (iv) obtaining further information to improve the understanding and management of already identified risks; and (v) analysing and learning lessons from events. An independent review of the RIM framework should be undertaken from time to time (ISO, 2018; COSO, 2017).

Communication and Consultation

The purpose of communication and consultation (CNC) is to assist relevant stakeholders in understanding risk. Communication seeks to promote awareness and understanding of risk, whereas consultation involves obtaining feedback and information to support decision-making. Communication and consultation with appropriate external and internal stakeholders should take place within and throughout all steps of the RIM process (ISO, 2018).

Organisational Culture

ORC is a set of core values, assumptions, understandings, and norms shared by members of an organisation (Schein, 1992; Daft, 2012). According to COSO (2017), ERM is the culture that organisations rely on to manage risk in creating, preserving, and realising value. Furthermore, one of the core RIM principles for value creation and protection is human and cultural factors (ISO, 2018). This study emphasises ORC as a crucial antecedent of ERM practices. Theoretically, there are several organisational factors, such as leadership, control, relationship, capability, workload, open communication, and market orientation, that influence ORC.

Leadership

Hellriegel and Slocum (1992) define leadership as the ability to influence, motivate, and guide other members of an organisation to achieve intended goals. Leadership and culture researchers have argued that a leader's behaviour helps culture grow and change (Schein, 1992; Kotter, 1996). Leaders control the mechanisms through which they influence culture (Schein, 1992). Leadership can shape culture through the development of competencies such as forging relationships of trust and building personal competencies of trust (Brockbank et al., 2002).

Nature of Business

The nature of business (IND) describes the type of business and its overall goals. It describes the legal structure, industry, product or service, and business activities to achieve its goals. It describes the business problem and the main focus of its services. The market or industry in which an organisation operates affects its ORC. Research by Christensen & Gordon (1999) and Torgaloz (2021) shows that the IND and industry characteristics influence the formation and development of the ORC.

Organisational Structure

Organisational Structure (OST) defines each organisation's job, function, and reporting system. This structure is developed to establish how an organisation operates and helps it achieve its growth goals. The OST allows assigning different functions and processes responsibilities to different actors. When employees work together on a mission within the constraints of a formal OST to achieve a specific goal, there are ways to relate and interact. This affects the formation of an organisation's ORC. Thus, it can be assumed that the OST model influences ORC (Nebojša, 2013).

Control System

Abernethy and Chua (1996) defined an organisational control (OCO) system as a combination of control mechanisms designed and implemented by management to increase the probability that organisational actors will behave in ways consistent with the objectives of the dominant organisational coalition. The relationship between OCO and ORC is widely studied by Nebojša (2013) and Andersen and Lueg (2016). In these studies, culture is seen as an element that generates particular forms of OCO.

Relationship

The state of connectedness between two or more people dictates the manner in which they interact, communicate, and behave with each other in pursuit of a shared organisational purpose. Relationships can be classified into various categories, including (i) Peer relationships, (ii) Supervisor-subordinate relationships, and (iii) Cross-functional relationships. Connecting ORC and employee relations means creating a strong link between an organisation's values, norms, and practices and the relationship between employees.

Capability

According to Ingham (2017), organisational capability (OCA) focuses on human, social, and organisational capital. Capability and culture are, of course, hugely connected and require dealing with many of the same aspects of an organisation. When OCA changes, ORC will change. Capability implies the positions to limit this to employee development and the 'tools' that are required in order to enhance both employee experience and engagement. To build the capability needed to embed RIM throughout the organisation and develop RIM maturity, the framework should provide relevant people with appropriate expertise, skills and knowledge (BSI, 2011).

Workload

According to Hart and Staveland (2008), a workload is a group or a number of activities that an organisational unit must complete within a certain period. Employee workloads and complex tasks are part of the function of the OST (Inegbedion et al., 2020). Workload is also a process carried out by a person to complete tasks for a job or group of positions under normal circumstances within a certain period (Zaki & Marzolina, 2016). The higher the workload experienced by employees, the lower the OCO they have. A study by Sitorus et al. (2022) shows that a high workload level is incapable of strengthening ORC.

Open Communication

Open communication (COM) is a style of communication in which people share ideas and information honestly and transparently. COM is based on trust, psychological safety, and consistency. In the workplace, COM means sharing information honestly and transparently at all levels of the organisation. COM can create a positive or negative ORC, depending on the quality, frequency, and style of communication. Communication that is open, honest, respectful, and supportive can foster a culture of trust, collaboration, and innovation. Communication plays a pivotal role in shaping the ORC. Clear and open communication creates a positive ORC (Sebastião et al., 2017).

Market Orientation

Market orientation (MOR) is a business approach wherein the processes of product development and creation are focused on satisfying the needs of consumers. Market-oriented businesses generate intelligence about customers' current and future needs and about competitors' capabilities and strategies, share that intelligence throughout the organisation, and take coordinated action to create superior customer value (Narver & Slater, 1990). The relationship between market orientation and culture is straightforward (Deshpande & Webster, 1989).

Rewards and Recognition

Recognition and reward (RRS) are present in a work environment where there is appropriate acknowledgement and appreciation of employees' efforts in a fair and timely manner. Recognition and reward programs have a significant impact on ORC by fostering a positive and motivating work environment. Reward systems express and reinforce the values and norms that comprise ORC (Kerr & Slocum, 2005). Wright (2013) indicates that the relationship between reward and culture is subtle, intricate and overlapping. The study of Lusty and Ariyanto (2023) also showed that compensation systems have a positive and significant effect on ORC.

Risk Governance Structure

ERM is an integration of RIM and COG (Lundqvist & Wilhelmsson, 2018). A crucial component of ERM is risk governance (RIG) (COSO, 2017). The significant principles of RIG are exercising board risk oversight, establishing governance and operating structure, and enforcing accountability. RIG provides greater awareness of ERM (Mohd-Sanusi, 2017). Simultaneously, banks need to ensure three lines of defence. Thus, for effective implementation of ERM, banks need to sustain an appropriate RIG structure. A risk governance structure (RGS) is a framework that denotes the responsibility and accountability for management and oversight of risks in an institution. The following essential functions and roles players must constitute the RGS of banks:

Internal Control

ICO are rules and processes that help a company comply with regulations and laws, improve operational efficiency and effectiveness, and achieve financial reporting dependability (Hazzaa et al., 2022). The purpose of ICO is to produce reasonable certainty of the following objectives: (i) The effectiveness and efficiency of operations, (ii) The reliability of financial and non-financial reporting, and (iii) Compliance with laws and regulations (COSO, 1992, 2013)

Board Structure

The board structure (BOS) is considered a critical success factor for any organisation. Some evidence also shows that stronger BOS reduce the likelihood of fraud (Chen et al., 2006) and expropriation through related party transactions (Lo et al., 2010). The core characteristics of effective BOS include (i) Board composition, (ii) Board expertise, (iii) Committees, (iv) Mandate, authority and responsibilities of committees and their composition and (iv) Independence. There is an association between corporate broad structure and corporate firm performance (Khan et al., 2021).

Risk Committee

A risk committee (RCO) is an independent panel or team put together by the BOD to assist in overseeing the organisation's risk strategy and creating an effective RIM framework that guards against significant losses. It is established as part of the RGS. The core roles and responsibilities of RCO are risk oversight, reviewing risk policies and controls, reporting and communication, compliance and regulatory adherence. Ng et al. (2013) find that a risk committee enhance ERM functions. Yeh et al. (2011) argue that an independent RCO monitors and controls risks effectively.

Management

These are the first lines of defence that represent the front-line operations of the organisation. This includes business units, departments, and individuals directly responsible for managing and executing processes and activities that generate risk. Their primary role is to identify, assess, and manage risks as an integral part of their daily operations. This is formed by managers and staff who are responsible for identifying and managing risk as part of their accountability for achieving objectives.

Risk Management and Compliance

Risk Management and Compliance (RMC) functions typically support the first line of defence with guidance, policies, and frameworks for implementing RIM in day-to-day processes. As a second-line defence whose functions such as financial controller, security, quality, inspections, compliance, etc., enable the identification of emerging risks in the daily operation of the business. Management and staff provide the policies, frameworks, tools, techniques and support to enable risk and compliance to be managed in the first line of defence.

Internal Audit

INA is an independent, objective assurance and consulting activity. Since INA forms the organisation's third line of defence, its core role in ERM is to provide objective assurance to the board on the effectiveness of RIM. The INA supports the business's management in directing operations by inspecting and evaluating the efficiency of business operations, RIM, and ICO and by producing information and recommendations to enhance efficiency. INA may provide consulting services that improve an organisation's governance, RIM, and control processes. The role of the INA in RIM is to provide an independent, objective assurance of the effectiveness of the organisation's RIM system.

External Audit

Functions of the external audit (EXA) with respect to RIM are (i) the external auditor providing an independent opinion on the effectiveness of RIM and (ii) providing the audit opinion. External auditors play a key role in the COG framework, and they ensure that the BOD and management are acting responsibly towards the shareholders' interest. The external auditors, by keeping objectivity, can add value to the shareholders and ensure that the company's ICO is solid and practical. The role of an EXA is crucial in achieving the objective of COG.

Organisational Dynamic Capability

The concept of dynamic capabilities (DYCs) is defined as an organisation's strategic capability that enables it to integrate internal and external competencies and address dynamic environments and periods of rapid change (Teece, 2007). Hanan and Hamed (2019) defined DYCs as a set of capabilities possessed by an organisation that enables it to sense its external environment, modify and expand its information and knowledge base, and achieve integration and coordination among all its activities and resources. Based on research by Abdaljabar and Alshear (2024), the authors have adopted five dimensions to measure DYCs in this study, as follows:

Sensing Capability

Teece (2018) defined sensing capability (SEN) as an organisation's ability to conduct external environmental scanning and gather unstructured information and data, which are then processed by the organisational system to identify threats and opportunities that may impact the organisation's future. Amari (2022) also defined it as the ability to sense the external environment and understand customer needs and market dynamics better than competitors.

Learning Capability

Organisational learning refers to an organisation's ability to acquire, absorb, transform, and share knowledge generated during joint activities with stakeholders and interactions among stakeholders (Dentoni et al., 2016). Learning (LRN) also focuses on translating knowledge and skills during coordination and communication in internal capabilities, seizing opportunities through developing and managing service delivery with stakeholders (Zhan et al., 2023). According to Al-Hilah et al. (2020), LRN is the ability to renew current operational capabilities with new knowledge.

Integration Capability

Integration is the process of acquiring, absorbing, and developing new resources, such as acquisitions or alliances, to gain access to technology for creating new procedures or patterns of practices within the organisation (Wall, 2010). Al-Hajjim and Al-Salman (2021) defined integration capabilities as the efficiency an organisation possesses to acquire available resources, combine them, and then deploy them to achieve the organisation's management visions. It also involves incorporating new capabilities and linking them with existing resources and capacities within the organisation.

Coordination Capability

Coordination capability (COR) is the amalgamation of organisational efforts from different functional groups to maintain individual alignment toward achieving the organisation's common objectives. Coordination is the process of linking different parts of the organisation, whether they are systems or market participants, to achieve a collective task. This process underscores the importance of managing communications, especially regarding partners like customers and suppliers (Bayón et al., 2021). COR emphasises the efficient management of activities and resources, emphasising harmony, cooperation, and activity coordination (Abdaljabar & Alshaer, 2024).

Reconfiguration Capability

Reconfiguration capability (REC) refers to an organisation's ability to reconfigure its resources, capabilities, or OST to respond and adapt to changing market conditions or opportunities. These capabilities include adjusting, integrating, or redeploying existing assets or current capabilities to create new offerings or valuable competitive advantages (Sirmon et al., 2007). The capability to reconfigure organisational resources allows organisations to develop new capabilities and, thus, leads to a broader range of management options (Cordes-Berszinn, 2013). Organisations with reconfiguration capability are characterised by their high flexibility (Dosi et al., 2001).

Relationship Between ORC and ERM

ORC and RIM are not parallel paths but rather intersecting lines that influence one another. Research by Togok (2016) shows a significant relationship between culture and the effectiveness of an organisation's ERM. In addition, the study of Mulalidhar (2010) found that ORC is one of the challenges to the implementation of ERM. On the other hand, research by Kimbrough and Componation (2015) showed that there is a correlation between ORC and ERM. From there, the research hypothesis is formulated as follows:

H1: *ORC positively impacts the ERM process.*

Relationship Between RGS and ERM

COG and ERM are linked together to assist firms in better understanding risks, improving and delivering their objectives, and mitigating, assessing, and appropriately managing risk (Zahiruddin & Norlida, 2013). Strong governance is core to the ERM and supports individuals and organisations across the company. A study by Sum and Khalik (2020) showed a positive significant relationship between RCS and ERM implementation. From there, the research hypothesis is stated as follows:

H2: *RGS positively impacts ERM.*

Relationship Between DYC and ERM

According to the COSO, ERM is defined as capabilities that organisations rely on to manage risk in creating, preserving, and realising value (COSO, 2017). That means organisational capability (OCA) influences the ERM process. The research by Tran Anh Hoa et al. (2021) shows that organisational DYCs, such as organisational change capacity and knowledge management process capability, influence ERM implementation. Therefore, the hypothesis is developed as follows:

H3: *DYC positively impacts ERM.*

Relationship Between ORC and RGS

The mechanism of mutual between ORC and OST proved that ORC generates its impact on OST both through its design and its implementation (Janićijević, 2013). Generally, ORC realises its impact on shaping OST by forming the interpretative schemes of the top management, which selects the OST model (James et al., 1990). RGS is a part of the OST. Thus, ORC affects RGS. A study by Evans (2018) showed that the ORC of the organisations directly influenced COG. ORC was a significant determinant of fulfilling the duties of companies' governance structure, and this is in accordance with the studies of Semenov (2000) and Licht (2001). Therefore, the hypothesis is developed as follows:

H4: *ORC positively impacts RGS.*

Relationship Between ORC and DYC

The resource-based theory is utilised as a foundation to understand the interrelationships between ORC and DYC better. The study by Hock et al. (2015) showed the impact of ORC on a firm's capability to innovate the business model. According to Cox and Xu (2023), ORC is one of the essential prerequisite antecedents to the organisational DYC framework. A study by Costello and Plester (2020) also demonstrates an explicit link between DYC and ORC concepts. Menghwar and Daood (2021) also demonstrate the role of ORC in the development of DYC. Therefore, the hypothesis is formulated as follows:

H5: *ORC positively impacts DYC.*

Relationship Between RGS and DYC

DYC lies on the way companies operate their structures, cultures and processes (O'reilly & Tushman, 2008), which require flexible coordination and resource-use strategies (Song et al., 2005). A study by Barbosa et al. (2021) showed that RGS had a positive and statistically significant influence on DYC. Agency theory premises can be used to analyze to which extent COG contributes to DYC development. Thus, we base on the theoretical propositions to formulate the following hypothesis:

H6: *RGS positively impacts DYC.*

Mediating Role of DYC in the Relationship between ORC and ERM

H7: *DYC plays a mediating role in the relationship between ORC and ERM.*

Mediating Role of ORC in the Relationship between RGS and ERM

H8: *ORC plays a mediating role in the relationship between RGS and ERM.*

Mediating Role of DYC in the Relationship between ORC and ERM

H9: *DYC plays a mediating role in the relationship between ORC and ERM.*

Mediating Role of ORC in the Relationship between RGS and DYC

H10: *ORC plays a mediating role in the relationship between RGS and DYC.*

Mediating Role of DYC in the Relationship between RGS and ERM

H11: *DYC plays a mediating role in the relationship between RGS and ERM.*

Mediating Role of RGS in the Relationship between ORC and DYC

H12: *RGS plays a mediating role in the relationship between ORC and DYC*

Moderating Effect of Demographic Variables on the Path Coefficients

H13-1: *The sex moderates the path coefficients of the structural model.*

H13-2: *The age moderates the path coefficients of the structural model.*

H13-3: *The education level moderates the path coefficients of the structural model.*

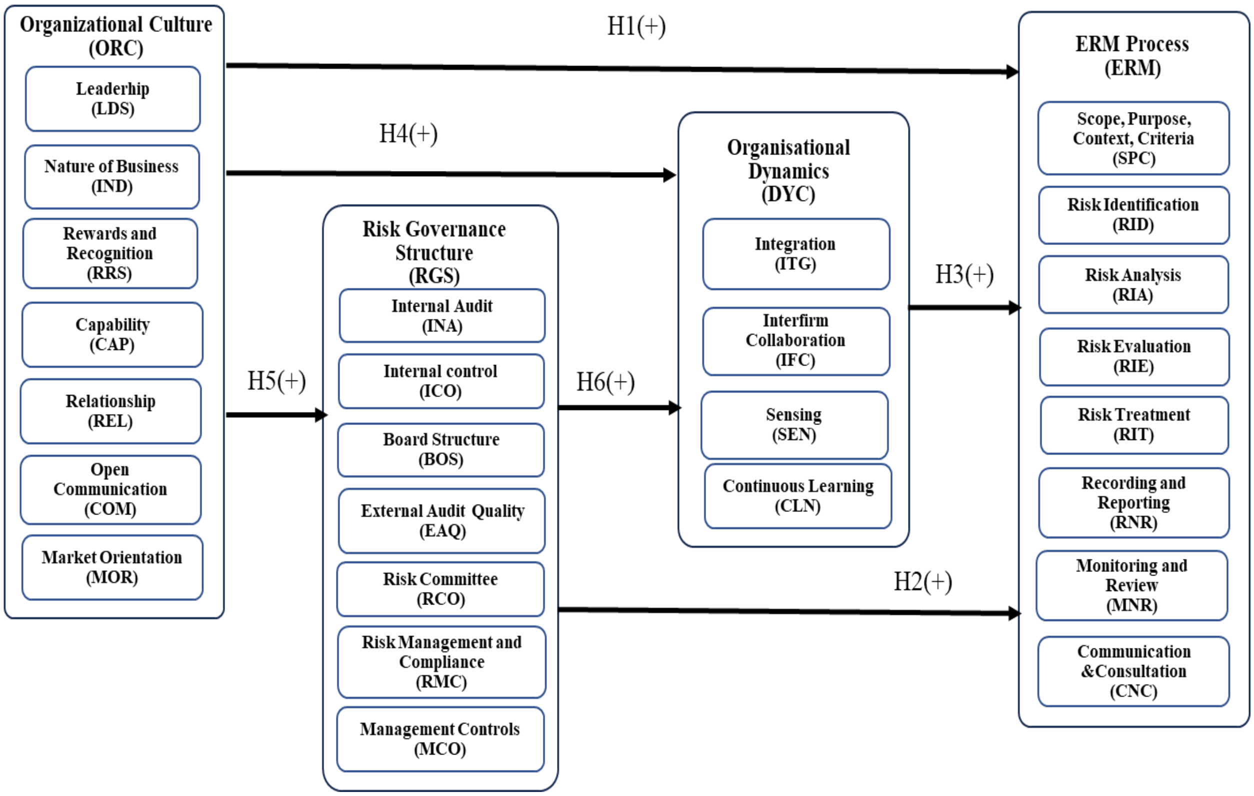
H13-4: *The work experience moderates the path coefficients of the structural model.*

H13-5: *Working position moderates the path coefficients of the structural model.*

H13-6: *The organisation level moderates the path coefficients of the structural model.*

Proposed Research Model

FIGURE 1
THE PROPOSED RESEARCH MODEL



Source: The authors

RESEARCH METHOD

Measurement Scales

Based on the reviewed literature, the authors build scales to measure the influence of ORC, RGS, and ORD on the ERM process. The elements of the constructs of the ERM process are inherited from the ISO 31000:2018 RIM process. The elements of constructs of RGS and ORD are inherited from the ISO 31000:2018 RIM principles. The authors build scales to measure the influence of ORC, RGS, and ORD on the ERM process, including 78 observed variables (see Table 1).

TABLE 1
MEASUREMENT SCALES

Variables	**Encoded scales**	**Quantity of observables**	**References**
Scope, Purpose, Context, Criteria	SPC	3	ISO (2018)
Risk Identification	RID	3	Hafizah et al. (2019) and Togok et al. (2014)
Risk Analysis	RIA	3	Hafizah et al. (2019) and Togok et al. (2014)

Variables	Encoded scales	Quantity of observables	References
Risk Evaluation	RIE	3	Hafizah et al. (2019) and Togok et al. (2014)
Risk Treatment	RIT	4	Hafizah et al. (2019); Togok et al. (2014)
Recording and Reporting	RNR	3	ISO (2018)
Monitoring and Review	MNR	3	ISO (2018)
Communication and Consultation	CNC	3	ISO (2018)
Leadership	LDS	3	Cemal Zehir et al. (2011)
Control	CON	3	Togok et al. (2014)
Relationship	REL	3	Llies&Judge (2002); Schein (1988)
Capability	CAP	3	Denison et al. (2006); Hung et al. (2010)
Workload	WOL	3	O'Meara et al. (2019)
Open Communication	COM	3	Zwijze-Koning and Menno de Jong (2007)
Market Orientation	MOR	3	Narver&Slater (1990)
Internal Control	ICO	3	COSO (2013)
Board Structure	BOS	3	Al-ahdal et al. (2020)
Risk Committee	RCO	3	The Chartered Governance Institute UK&Ireland (2022)
Risk Management and Compliance	RMC	3	Schuett (2023)
Management	MNM	3	Schuett (2023)
Internal Audit	INA	3	BSI (2011)
External Audit	EXA	3	Guy and Thomas (2024)
Sensing	SEN	3	Takahashi et al. (2016)
Learning	LRN	3	Hung et al. (2010); Denison et al. (2006)
Integration	ITG	3	Tseng & Lee (2012); ISO (2018)
Coordination	IFC	3	Hawass (2010); Narver&Slater (1990)
Reconfiguration	REC	3	Takahashi et al. (2016)

Source: Result of qualitative research

Focus Group Discussion

To re-evaluate the proposed research model (Figure 1) and the suitability of the scale with the research context, the method of interviewing experts using a structured questionnaire was implemented. Experts interviewed include 7 people knowledgeable about RM in the banking sector, including members of the bank's management board, lecturers, and university researchers. Before the interview, the contents of the research topic were sent to the experts. At the end of the interview process, the authors summarise the qualitative research results and use these results for the following research steps.

Quantitative Research

The research was conducted using a direct interview technique, using a questionnaire with a 5-level Likert scale sent to managers and staff working in ERM-related positions at their offices in CJSB in HCMC, Vietnam. The non-probability, purposive sampling combined with the snowball method was used. 650

sheets of questionnaires were distributed, 475 were collected, and 450 valid questionnaires were used. SmartPLS 4 software is used to process the data.

RESULTS AND DISCUSSION

Descriptive Statistics

TABLE 2
DESCRIPTIVE STATISTICS

Characteristics		Frequency	Rate (%)
Sex	Female	272	60.4
	Male	178	39.6
Age	Under 25	82	18.2
	From 25 to 34	145	32.2
	From 35 to 44	140	31.1
	From 45 and over	83	18.4
Organisation	Head office	100	22.2
	Branch	211	46.9
	Transaction office	139	30.9
Education	Undergraduate	129	28.7
	Graduate	248	55.1
	Postgraduate	73	16.2
Working experience	Under 5 years	69	15.3
	From 6 to 10 years	161	35.8
	From 11 to 14 years	149	33.1
	From 15 years – and over	71	15.8
Working position	Internal control and internal audit officers	87	19.3
	Credit officiers	153	34
	Treasury and payment officers	130	28.9
	Others	80	17.8

Source: Result of qualitative research

VALIDATING MEASUREMENT MODEL FOR LOWER ORDER CONSTRUCTS (LOC)

Assessing the Quality of Indicators

TABLE 2A
OUTER LOADINGS OF THE CONSTRUCTS

	BOS	CAP	CLN	CNC	EAQ	ICO	IFC	INA	IND	ITG	LDS	MCO	MNR
BOS1	0.832												
BOS2	0.850												
BOS3	0.868												
CAP1		0.877											
CAP2		0.895											
CAP3		0.919											
CLN1			0.893										
CLN2			0.873										
CLN3			0.903										
CNC1				0.897									
CNC2				0.850									
CNC3				0.849									
EAQ1					0.880								
EAQ2					0.875								
EAQ3					0.908								
ICO1						0.826							
ICO2						0.839							
ICO3						0.839							
IFC1							0.917						
IFC2							0.850						
IFC3							0.918						
INA1								0.842					
INA2								0.872					
INA3								0.870					
IND1									0.821				
IND2									0.823				
IND3									0.819				
ITG1										0.787			
ITG2										0.837			
ITG3										0.832			
LDS1											0.858		
LDS2											0.791		
LDS3											0.819		
MCO1												0.811	
MCO2												0.889	
MCO3												0.845	

	BOS	CAP	CLN	CNC	EAQ	ICO	IFC	INA	IND	ITG	LDS	MCO	MNR
MNR1													0.900
MNR2													0.845
MNR3													0.870

Source: Result of data processing

TABLE 2B
OUTER LOADINGS OF THE CONSTRUCTS

	MOR	OCO	RCO	REL	RIA	RID	RIE	RIT	RMC	RNR	RRS	SEN	SPC
MOR1	0.844												
MOR2	0.828												
MOR3	0.848												
OCO1		0.916											
OCO2		0.912											
OCO3		0.815											
RCO1			0.862										
RCO2			0.883										
RCO3			0.914										
REL1				0.856									
REL2				0.865									
REL3				0.905									
RIA1					0.837								
RIA2					0.807								
RIA3					0.842								
RID1						0.849							
RID2						0.811							
RID3						0.781							
RIE1							0.804						
RIE2							0.869						
RIE3							0.829						
RIT1								0.806					
RIT2								0.842					
RIT3								0.817					
RIT4								0.778					
RMC1									0.870				
RMC2									0.836				
RMC3									0.869				
RNR1										0.900			
RNR2										0.902			
RNR3										0.874			
RRS1											0.796		

	MOR	OCO	RCO	REL	RIA	RID	RIE	RIT	RMC	RNR	RRS	SEN	SPC
RRS2											0.798		
RRS3											0.826		
SEN1												0.922	
SEN2												0.921	
SEN3												0.87	
SPC1													0.874
SPC2													0.866
SPC3													0.833

Source: Result of data processing

The results of the evaluation of the reflective measurement model of COG and INA show that the Outer loadings of the variables are all greater than or equal to 0.7 (see Table 2a, 2b).

Assessment of Reliability and Validity of Constructs

The composite confidence (CR) is equal to or greater than or equal to 0.735 (see Table 3). This means that the scales have an internally consistent level of confidence. In addition, the extracted variance (AVE) values of all scales satisfy the condition greater than 0.653 (see Table 3). This proves that the scales are all convergent.

TABLE 3
CONSTRUCT RELIABILITY AND VALIDITY

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
BOS	0.809	0.812	0.887	0.723
CAP	0.879	0.885	0.925	0.805
CLN	0.869	0.869	0.920	0.792
CNC	0.832	0.835	0.900	0.749
EAQ	0.866	0.868	0.918	0.788
ICO	0.782	0.782	0.873	0.696
IFC	0.876	0.880	0.924	0.802
INA	0.826	0.828	0.896	0.742
IND	0.758	0.758	0.861	0.674
ITG	0.754	0.755	0.859	0.670
LDS	0.761	0.765	0.863	0.678
MCO	0.806	0.809	0.885	0.721
MNR	0.842	0.846	0.905	0.760
MOR	0.792	0.793	0.878	0.706
OCO	0.857	0.867	0.913	0.779
RCO	0.863	0.867	0.917	0.786
REL	0.847	0.852	0.908	0.766
RIA	0.772	0.773	0.868	0.687

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
RID	0.746	0.752	0.855	0.663
RIE	0.783	0.790	0.873	0.696
RIT	0.832	0.858	0.885	0.663
RMC	0.821	0.823	0.894	0.737
RNR	0.871	0.872	0.921	0.795
RRS	0.732	0.734	0.848	0.651
SEN	0.889	0.891	0.931	0.818
SPC	0.821	0.825	0.893	0.736

Source: Result of data processing

Discriminants Validity

The result of assessing the discriminant validity of constructs by HTMT ratios and the Fornell-Lacker criterion shows that the index of HTMT is less than 0.85, and the square root of AVE of all constructs is greater than its correlations with other constructs in the model. Therefore, we can assume that the constructs meet the discriminant validity.

TABLE 4A
HTMT CRITERIA

	BOS	CAP	CLN	CNC	EAQ	ICO	IFC	INA	IND	ITG	LDS	MCO	MNR
BOS													
CAP	0.211												
CLN	0.100	0.322											
CNC	0.355	0.196	0.416										
EAQ	0.183	0.229	0.236	0.287									
ICO	0.113	0.151	0.162	0.268	0.163								
IFC	0.275	0.184	0.312	0.317	0.233	0.239							
INA	0.241	0.259	0.434	0.356	0.302	0.414	0.336						
IND	0.432	0.443	0.242	0.326	0.416	0.260	0.385	0.419					
ITG	0.275	0.254	0.287	0.371	0.398	0.203	0.395	0.273	0.656				
LDS	0.573	0.375	0.191	0.317	0.416	0.126	0.352	0.420	0.761	0.442			
MCO	0.160	0.172	0.210	0.285	0.169	0.483	0.216	0.428	0.258	0.231	0.186		
MNR	0.345	0.286	0.370	0.620	0.332	0.276	0.353	0.332	0.367	0.360	0.398	0.266	

Source: Result of data processing

TABLE 4B
HTMT CRITERIA

	MOR	OCO	RCO	REL	RIA	RID	RIE	RIT	RMC	RNR	RRS	SEN	SPC
MOR													
OCO	0.473												
RCO	0.399	0.304											
REL	0.497	0.402	0.200										
RIA	0.476	0.450	0.252	0.369									
RID	0.432	0.307	0.379	0.320	0.364								
RIE	0.340	0.379	0.129	0.301	0.440	0.227							

	MOR	OCO	RCO	REL	RIA	RID	RIE	RIT	RMC	RNR	RRS	SEN	SPC
RIT	0.397	0.436	0.280	0.292	0.270	0.448	0.362						
RMC	0.431	0.230	0.272	0.325	0.270	0.340	0.197	0.243					
RNR	0.315	0.348	0.192	0.291	0.455	0.298	0.330	0.390	0.286				
RRS	0.807	0.650	0.413	0.509	0.457	0.480	0.330	0.332	0.556	0.428			
SEN	0.285	0.297	0.298	0.253	0.356	0.397	0.166	0.210	0.332	0.267	0.497		
SPC	0.274	0.379	0.122	0.224	0.389	0.158	0.407	0.344	0.075	0.344	0.264	0.338	

Source: Result of data processing

TABLE 5A
FORNELL-LARCKER CRITERIA

	BOS	CAP	CLN	CNC	EAQ	ICO	IFC	INA	IND	ITG	LDS	MCO	MNR
BOS	0.850												
CAP	0.182	0.897											
CLN	0.086	0.282	0.890										
CNC	0.291	0.170	0.354	0.866									
EAQ	0.156	0.201	0.205	0.244	0.888								
ICO	0.092	0.127	0.134	0.216	0.135	0.835							
IFC	0.233	0.160	0.273	0.271	0.203	0.197	0.896						
INA	0.202	0.222	0.368	0.297	0.257	0.333	0.286	0.861					
IND	0.342	0.366	0.197	0.260	0.338	0.200	0.314	0.333	0.821				
ITG	0.217	0.208	0.232	0.295	0.321	0.156	0.322	0.216	0.496	0.819			
LDS	0.450	0.311	0.154	0.253	0.337	0.098	0.287	0.333	0.579	0.335	0.823		
MCO	0.131	0.146	0.175	0.233	0.144	0.384	0.181	0.350	0.203	0.180	0.148	0.849	
MNR	0.287	0.249	0.317	0.519	0.285	0.224	0.304	0.279	0.295	0.289	0.321	0.223	0.872

Source: Result of data processing

TABLE 5B
FORNELL-LARCKER CRITERIA

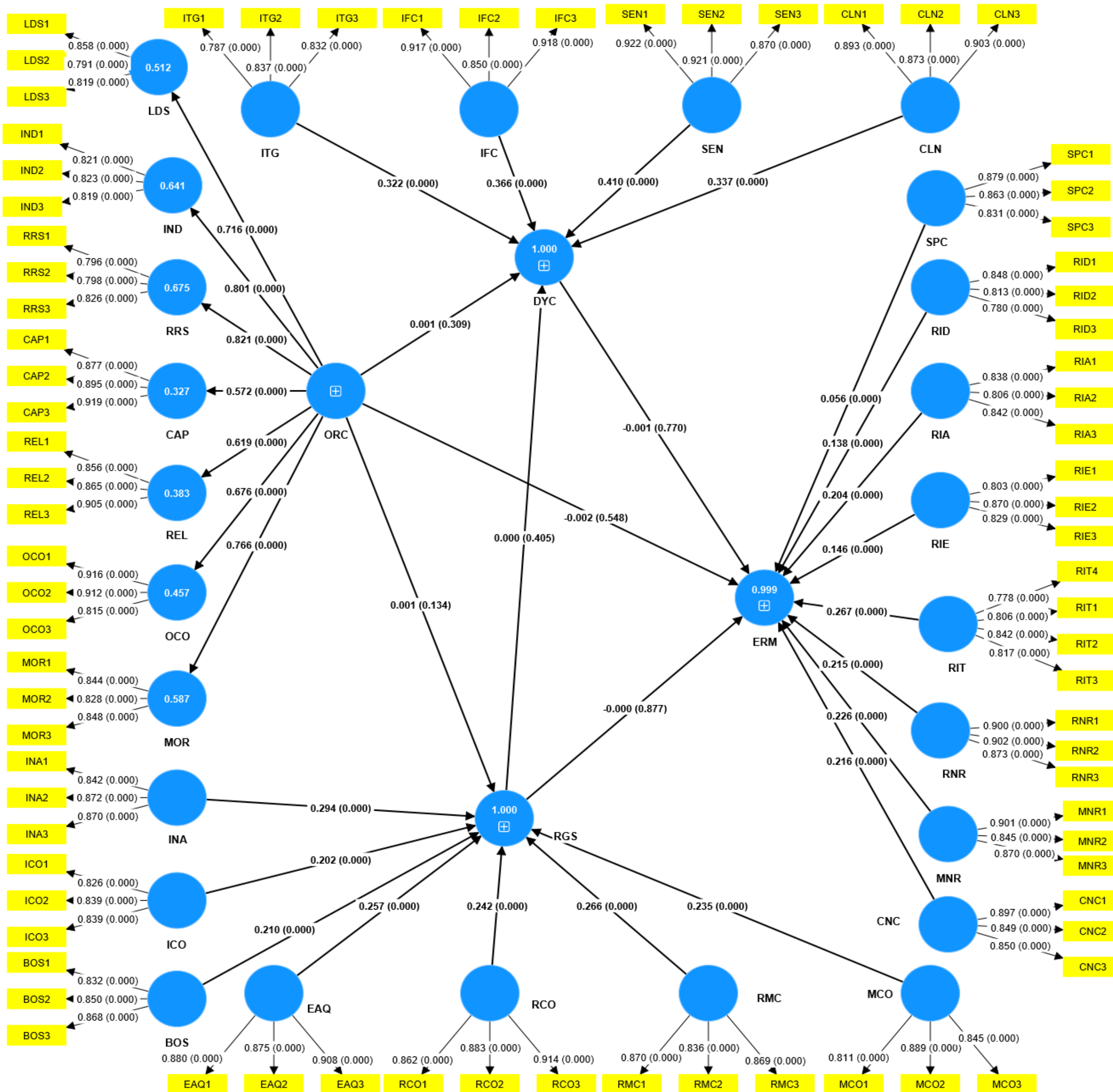
	MOR	OCO	RCO	REL	RIA	RID	RIE	RIT	RMC	RNR	RRS	SEN	SPC
MOR	0.840												
OCO	0.393	0.882											
RCO	0.331	0.264	0.886										
REL	0.408	0.345	0.172	0.875									
RIA	0.372	0.367	0.207	0.298	0.829								
RID	0.333	0.251	0.305	0.260	0.276	0.814							
RIE	0.268	0.315	0.108	0.245	0.346	0.173	0.834						
RIT	0.346	0.388	0.253	0.267	0.462	0.387	0.320	0.811					
RMC	0.347	0.194	0.231	0.271	0.214	0.268	0.157	0.204	0.858				
RNR	0.260	0.302	0.168	0.250	0.375	0.242	0.276	0.338	0.240	0.892			
RRS	0.615	0.516	0.331	0.403	0.344	0.359	0.251	0.266	0.431	0.341	0.807		
SEN	0.239	0.260	0.262	0.223	0.296	0.329	0.140	0.185	0.285	0.235	0.401	0.905	
SPC	0.220	0.319	0.102	0.186	0.311	0.126	0.327	0.293	0.053	0.291	0.204	0.288	0.858

Source: Result of data processing

The processing result shows that all items' cross-loadings are higher on their parent construct than other constructs in the model. Thus, there are issues of discriminant validity.

Path Coefficients of the Measurement Model

FIGURE 1
PATH COEFFICIENTS OF THE MEASUREMENT MODEL OF LOC



Source: Results of data processing

Validating Measurement Model for Higher-Order Constructs (HOC)

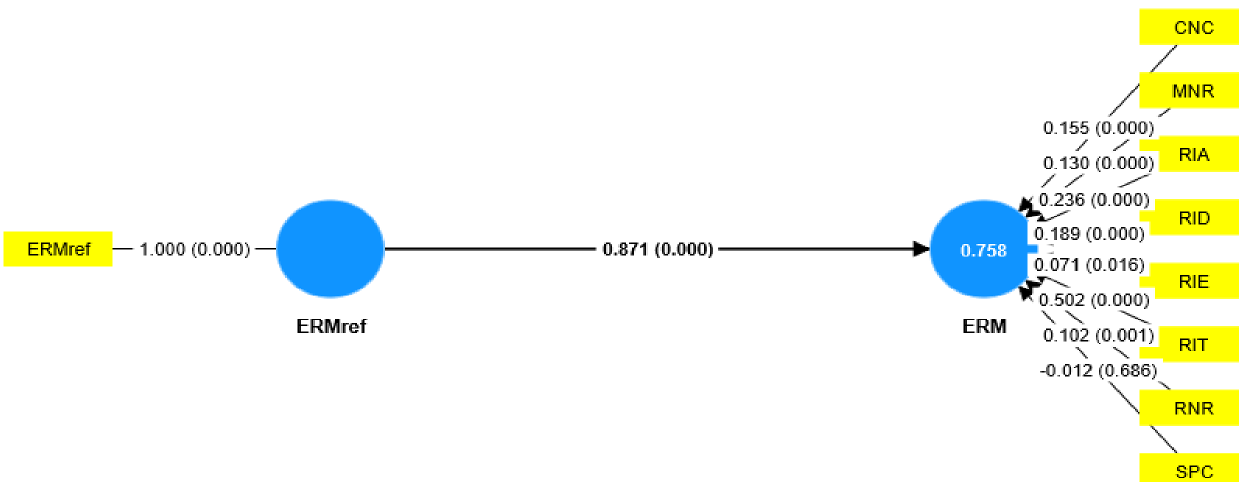
The measurement model of the high-order construct ERM was evaluated using the embedded two-stage method. The degree of correlation between the new scale and other variables, as well as other measures aimed at the same construct, is evaluated by convergent validity (see Figure 2).

ASSESSMENT OF FORMATIVE MODEL

Assessment of Convergent Validity

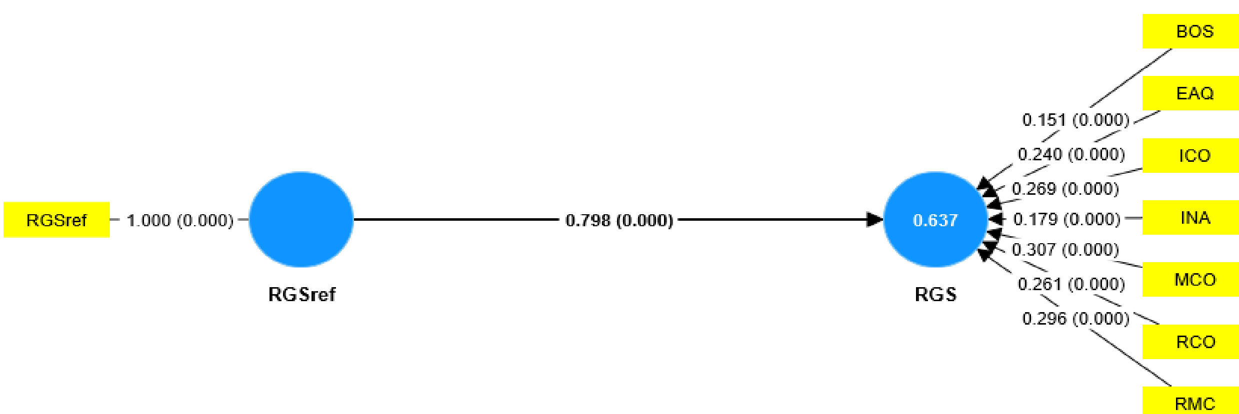
Using a repeated indicator approach, the formative measurement model of the latent concept of ERM, RGS, and DYC was evaluated. Redundancy analysis was used to assess the convergence of formative scales (Chin, 1998). The standardised beta coefficient must be 0.708 to be considered convergent (Hair et al., 2017). The findings show accurate ERM convergence with a beta coefficient of 0.871, an R2 of 0.758, an adjusted R2 of 0.758 (see Figure 3), RGS convergence with a beta coefficient of 0.798, an R2 of 0.637, and an adjusted R2 of 0.637 (see Figure 4), and DYC convergence with a beta coefficient of 0.837, an R2 of 0.701, and an adjusted R2 of 0.700 (see Figure 5).

FIGURE 3
CONVERGENCE VALIDITY OF LOWER-ORDER CONSTRUCT ERM



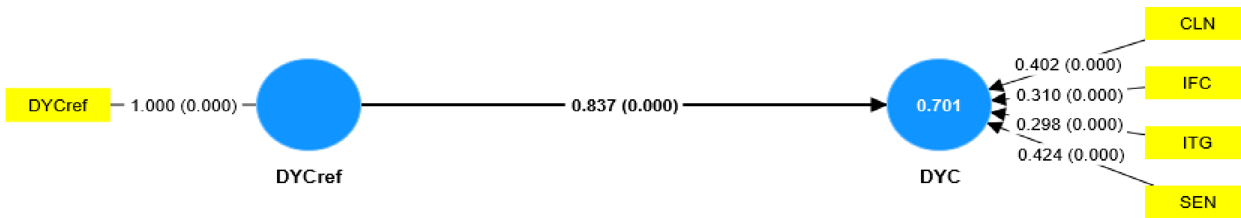
Source: Results of data processing

FIGURE 4
CONVERGENCE VALIDITY OF LOWER-ORDER CONSTRUCT RGS



Source: Results of data processing

FIGURE 5
CONVERGENCE VALIDITY OF LOWER-ORDER CONSTRUCT DYC



Source: Results of data processing

Assessment of VIF

Results from multicollinearity tests were less than 3, and P < 0.05 was used to indicate statistical significance (see Table 8).

Assessment of Outer Weights

Evaluation of the formative model of latent variables DYC, RGS, and ERM showed that observed variables with Outer weights were all greater than 0.1 with p<0.05. Thus, the second-order variables are assumed to be significant in the model (see Table 8).

ASSESSMENT OF THE REFLECTIVE MODEL OF HOC

Assessment of Outer Loadings

Evaluation of the reflective model of latent variables (ORC) showed that observed variables with external loadings coefficients (Outer Loadings) were greater than 0.7 with p<0.05, except that of CAP, OCO, and REL with 0.549, 659, and 609, respectively. However, their composite reliability are greater than 0.7 and their AVE are greater than 0.5, we can assume that the observed variables are all significant in the model. The bootstrapping results show that the Outer Loadings of the relationship between the second-order and quadratic variables (CAP, IND, LDS, MOR, OCO, REL, and RRS with ORC) have p<0.05 (see Table 8). Thus, the second-order variables are significant in the model.

Assessment of Construct Reliability and Validity

The construct reliability assessment reveals high reliability and explainability of the scales, with Cronbach's alpha and composite reliability above 0.7 and the extracted variance above 0.5, proving convergence (see Table 6).

TABLE 6
CONSTRUCT RELIABILITY AND VALIDITY

Constructs	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
CAP <- ORC	0.549	0.547	0.050	11.056	0.000
IND <- ORC	0.813	0.813	0.020	40.342	0.000
LDS <- ORC	0.732	0.731	0.030	24.601	0.000
MOR <- ORC	0.767	0.767	0.025	30.605	0.000
OCO <- ORC	0.659	0.657	0.035	18.602	0.000
REL <- ORC	0.609	0.606	0.043	14.175	0.000
RRS <- ORC	0.831	0.831	0.016	51.011	0.000

Source: Results of data processing

Assessment of Discriminant Validity

The reflective model of HOC achieves discriminant validity using the HTMT and Fornell-Larcker criterion, with the HTMT index of latent variables being less than 0.85 and the square roots of AVE larger than the coefficients (see Table 7).

TABLE 7
HTMT RATIOS AND FORNELL-LARCKER CRITERION

Construct	HTMT	Construct	Fornell-Larcker
	ORC		COG
ORC		COG	0.716

Source: Results of data processing

TABLE 8
TESTING RESULTS OF THE HIGHER-ORDER CONSTRUCT (HOC)

HOC	Variables	Outer Weights	Outer loadings	P value	T statistics	VIF
ERM	CNC	0.139		0.020	2.325	1.624
	MNR	0.173		0.006	2.767	1.703
	RIA	0.235		0.001	3.401	1.586
	RID	0.375		0.000	5.552	1.204
	RIE	0.134		0.033	2.128	1.244
	RIT	0.148		0.027	2.219	1.870
	RNR	0.129		0.044	2.010	1.423
	SPC	0.223		0.002	3.136	1.268
RGS	BOS	0.309		0.000	6.530	1.132
	EAQ	0.350		0.000	7.698	1.161
	ICO	0.112		0.032	2.151	1.241
	INA	0.336		0.000	6.435	1.331
	MCO	0.109		0.035	2.113	1.297
	RCO	0.287		0.000	5.929	1.139
	RMC	0.183		0.001	3.382	1.284
DYC	CLN	0.373		0.000	5.100	1.154
	IFC	0.275		0.000	4.563	1.209
	ITG	0.414		0.000	7.332	1.260
	SEN	0.373		0.000	5.836	1.301
ORC	CAP		0.549	0.000	10.095	
	IND		0.813	0.000	21.131	
	LDS		0.732	0.000	16.886	
	MOR		0.767	0.000	19.036	
	OCO		0.659	0.000	14.742	
	REL		0.609	0.000	12.880	
	RRS		0.831	0.000	19640	

Source: Results of data processing

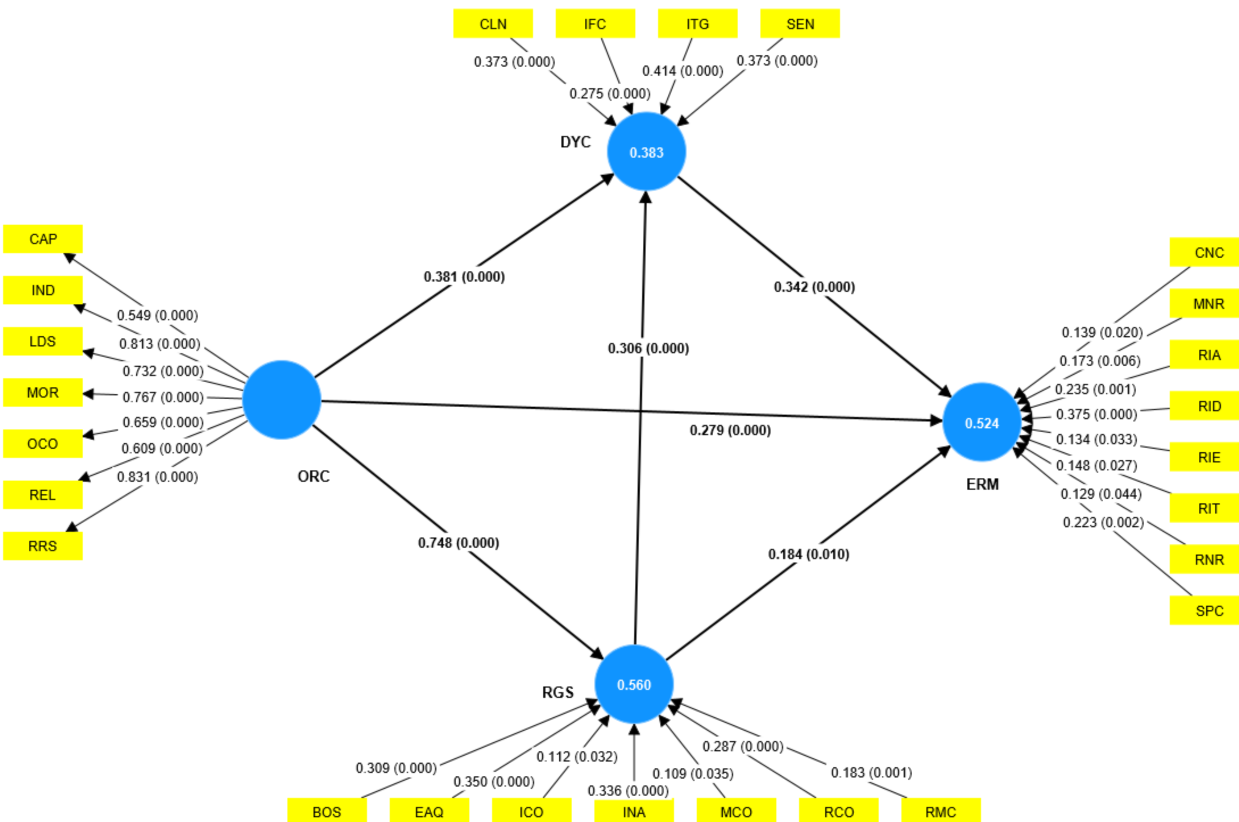
The results of the assessment of the higher-order constructs showed that reliability and validity, discriminant validity, and multicollinearity validity of all scales of the models were statistically significant, with $p < 0.05$ (see Table 8).

ASSESSMENT OF THE STRUCTURAL MODEL

Path Coefficients of the Model

The results of the structural model assessment showed that the path coefficients in the structural model were statistically significant, with $p < 0.05$ (see Table 9). The diagram of the paths of the structural model is shown in Figure 5.

FIGURE 5
PATH COEFFICIENTS OF THE STRUCTURAL MODEL



Source: Results of data processing

TABLE 9
PATH COEFFICIENTS OF THE STRUCTURAL MODEL

Constructs	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
DYC -> ERM	0.342	0.340	0.067	5.092	0.000
ORC -> DYC	0.381	0.380	0.057	6.746	0.000
ORC -> ERM	0.306	0.305	0.073	4.170	0.000
ORC -> RGS	0.748	0.750	0.024	31.726	0.000

Constructs	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
RGS -> DYC	0.279	0.286	0.059	4.754	0.000
RGS -> ERM	0.184	0.192	0.072	2.572	0.010

Source: Results of data processing

Collinearity of the Independent Variables (Inner VIF)

The results of the assessment of the collinearity of the independent variables showed that the inner VIFs of the structural model are lower than 3. Thus, the model does not encounter multicollinearity (Hair et al., 2017).

TABLE 10
PATH COEFFICIENTS OF THE STRUCTURAL MODEL

Paths	VIF	Paths	VIF
DYC -> ERM	1.620	ORC -> RGS	1.000
ORC -> DYC	2.272	RGS -> DYC	2.272
ORC -> ERM	2.507	RGS -> ERM	2.398

Source: Results of data processing

Assessment of Coefficient of Determination (R^2)

Checking the level of explanation of the independent variables on the dependent variable shows that the standardised R2 and adjusted R2 values of constructs ERM, RGS, and DYC were statistically significant. The level of explanation of the independent variables on the dependent variables is from medium to high (see Table 11).

TABLE 11
R^2 AND R^2 ADJUSTED COEFFICIENT

Constructs	R^2	Adjusted R^2	Description by Hair et al. (2017)
ERM	0.524	0.521	High
RGS	0.560	0.521	High
DYC	0.383	0.380	Medium

Source: Results of data processing

Assessment of Effect Size (f^2)

Assessing the importance of the independent variables, effect size (f2) shows that the level of the impact of RGS on ERM, RGS on DYC, and ORC on ERM is at a low level (f2<0.15); the impact of ORC on RGS is at a high level (f2>0.35); the impact of DYC on ERM is at a moderate level (f2<0.35), and ERM has no effect at all (see Table 12).

TABLE 12
THE VALUE OF F^2

Constructs	ERM	ORC	RGS	DYC	Impact Level by Cohen (1988)
ERM					No effect
RGS	0.030				Low
RGS				0.056	Low
DYC	0.152				Moderate
ORC	0.079				Low
ORC			1.272		High
ORC				0.104	Low

Source: Results of data processing

The results of testing the predictive capacity index q2 of each component model in the structural model show that the model has a moderate predictive level for the ERM, DYC, and RGS with q2 = 0.192, q2 = 0.178, q2 = 0.175, respectively, and has a no predictive for the ORC, with q2 = 0.000 (see Table 13).

TABLE 13
THE VALUE OF Q2

Constructs	SSO	SSE	q^2 (=1-SSE/SSO)	Predictive relevance
ERM	3,600.000	2,844.593	0.210	Moderate
DYC	1,800.000	1,480.058	0.178	Moderate
ORC	3,150.000	3,150.000	0.000	No relevance
RGS	3,150.000	2,597.728	0.175	Moderate

Source: Results of data processing

Thus, according to the research results in the above sections, all hypotheses from H1 to H6 are supported.

Mediating Roles Test

Testing the mediating role of variables in the structural model shows that the specific indirect effect test for each indirect relationship in the structural model shows that the p-values of all paths are < 0.05 (see Table 14). The total effect test shows that each effect of the independent variables on the dependent variable in the structural model is statistically significant, with a p-value < 0.05 (see Table 15). This shows an indirect relationship between RGS, ORC and ERM, and ORC and DYC exist in the model (see Table 16).

TABLE 14
SPECIFIC INDIRECT EFFECTS

Paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
RGS -> DYC -> ERM	0.096	0.098	0.029	3.280	0.001
ORC -> RGS -> DYC -> ERM	0.071	0.073	0.022	3.281	0.001
ORC -> DYC -> ERM	0.130	0.129	0.030	4.395	0.000
ORC -> RGS -> DYC	0.209	0.214	0.045	4.676	0.002
ORC -> RGS -> ERM	0.138	0.144	0.054	2.545	0.000

Source: Results of data processing

TABLE 15
TOTAL INDIRECT EFFECTS

Paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ORC -> DYC	0.209	0.214	0.045	4.676	0.000
ORC -> ERM	0.340	0.346	0.060	5.708	0.000
RGS -> ERM	0.096	0.098	0.029	3.280	0.001

Source: Results of data processing

TABLE 16
DIRECT, INDIRECT, AND TOTAL EFFECTS

Independent variable Dependent variable	Type of effects	ERM	RGS	DYC
ORC	Direct	0.306	0.748	0.381
	Indirect	0.340		0.209
	Total	**0.646**	**0.748**	**0.590**
RGS	Direct	0.184		0.279
	Indirect	0.096		
	Total	**0.280**		**0.279**
DYC	Direct	0.342		
	Indirect			
	Total	**0.342**		

Source: Results of data processing

Moderating Role of Categorical Variables

The multigroup analysis (MGA) performed with the MICOM analysis technique showed that there is a difference in the path coefficients in the model under the moderation of the respondents' work experience, positions, and bank organisations. The path coefficient of ORC->RGS for the head office is greater than that of the transaction office (see Table 17). The path coefficient of DYC->ERM for control and audit officers is smaller than that of treasury and payment officers. The path coefficient of RGS->ERM for control and audit officers is higher than that of treasury and payment officers (see Table 18a). The path coefficient of DYC->ERM for control and audit officers is smaller than that of credit officers. The path coefficient of RGS->ERM for control and audit officers is higher than that of credit officers (see Table 18b). The path coefficient of ORC->ERM for employees with work experience under 5 years is greater than 14 years and over (see Table 19).

TABLE 17
MGA'S RESULT OF HEAD OFFICE-TRANSACTION OFFICE

Paths	Head Office-Transaction Office			
	Head Office	Transaction office	Difference	P value
ORC -> RGS	0.825	0.4715	0.110	0.040

Source: Results of data processing

TABLE 18A
MGA'S RESULT OF POSITIONS

Paths	Control & Audit Officers – Treasury & Payment Officers			
	Control & Audit Officers	Treasury & Payment Officers	Difference	P value
DYC -> ERM	-0.056	0.470	-0.526	0.012
RGS -> ERM	0.621	0.164	0.457	0.020

Source: Results of data processing

TABLE 18B
MGA'S RESULT OF POSITIONS

Paths	Control & Audit Officers – Credit officer			
	Control & Audit Officers	Credit officers	Difference	P value
DYC -> ERM	-0.056	0.471	-0.526	0.011
RGS -> ERM	0.621	0.121	0.500	0.011

Source: Results of data processing

TABLE 19
MGA'S RESULT OF WORK EXPERIENCE

Paths	Under 5 years - 15 years to 19 years			
	Under 5 years	10 years to 19 years	Difference	P value
ORC -> ERM	0.610	-0.164	0.530	0.031

Source: Results of data processing

Discussion

Research results show that ERM is significantly associated with RID, SPC, MNR, RIT, CNC, RIE, and RNR with an outer weight of 0.375, 0.223, 0.173, 0.148, 0.139, 0.134, and 0.129, respectively. This is consistent with ISO (2018). DYC is significantly associated with ITG, SEN, CLN, and IFC with an outer weight of 0.414, 0.373, 0.373 and 0.275, respectively. That is consistent with Abdaljabar and Alshear (2024). RGS is significantly associated with EAQ, INA, BOS, RCO, RMC, ICO, and MCO, with an outer weight of 0.350, 0.336, 0.309, 0.287, 0.183, and 0.109. That is consistent with Yeh et al. (2011), Ng et al. (2013), Lundqvist and Wilhelmsson (2018), COSO (1992, 2013, 2017), and Khan et al. (2021). ORC is significantly influenced by LDS, with an outer loading of 0.732; IND, with an outer loading of 0.813; RRS, with an outer loading of 0.831; CAP, with an outer loading of 0.5449; REL, with an outer loading of 0.609; OCO with an outer loading of 0.659; and MOR, with an outer loading of 0.767. That is consistent with Narver & Slater (1990), Schein (1992), Kotter (1996), Janićijević (2013), Andersen and Lueg (2016), Sebastião et al. (2017), Jon Ingham (2017), Torgaloz (2021), Sitorus et al. (2022), and Lusty and Ariyanto (2023).

The research results also show that ORC positively impacts the ERM process with the standardised regression coefficient β = 0.279. This is consistent with the view that a critical influence on enterprise risk management is culture (COSO, 2017). On the other hand, RSG and DYC positively influence the ERM process with the standardised regression coefficients β = 0.184 and 0.306, respectively. This is consistent with the view that ERM is a capability and practice (COSO, 2017; ISO, 2018). In addition, DYC plays a mediating role in the relationship between ORC and ERM and between RGS and ERM; RGS plays a mediating role in the relationship between ORC and ERM; and RGS plays a mediating role in the relationship between ORC and ERM and between ORC and DYC. The multi-group analysis (MGA) results show a difference in the path coefficient under the moderating of the bank's organisation, employees' work experience, and positions.

Thus, 14 of the 16 hypotheses are supported by the research.

CONCLUSION AND IMPLICATIONS

RGS is a critical component of good COG. Effective integration of RGS components such as INA, ICO, BOS, EAQ, RCO, RMC, and MCO will help increase the effectiveness of the bank’s ERM. This indicates that a good COG with core principles such as responsibility, accountability, transparency, and fairness will improve the ERM process of the banks. Moreover, a responsible and accountable RMC and MCO, along with an effective ICO system, will create a solid first and second line of defence. An effective INA, in its value proposition of assurance, insight, and objectivity, along with the responsible risk committee, will provide independent assurance for the third line of defence in banks' ERM. An independent board structure with diverse skills and expertise that align with the bank’s needs provides strategic direction and oversight for the bank. It ensures that the bank complies with laws and regulations. EAQ plays a crucial role in evaluating and ensuring the effectiveness of the company’s management systems.

DYC plays a mediating role in the relationship between ORC and ERM and between RGS and ERM. That means DYC is an ERM antecedent and a consequence of the banks' RGS and ORC. To strengthen the ERM process, banks should keep improving DYC and good COG practices. Since RGS plays a mediating role in the relationship between ORC and ERM and between DYC and ORC, improving ERM maturity and control capacity, banks need an RGS that provides assurance and insight with its objectivity where it is most needed.

The construction of the research model is a multi-dimensional high-order model that facilitates testing of the overall complexity and evaluation of the conceptual DYC, RGS, ORC, and ERM. In addition, the higher-order structure provides a means to reduce collinearity between constructs and helps to reduce the number of path model relationships. The higher-order model of the ERM, DYC and RGS variable is a formative model that allows the identification of the critical elements of a multidimensional concept.

Because ERM is considered a culture (COSO, 2017) and a crucial principle of RIM is human and cultural factors (ISO, 2018), banks should have a development orientation consistent with basic assumptions and values relevant to the industry environment regarding customers, competitors, and society. A transformational leadership style should be valued. In addition, the organisation's risk culture will be enhanced if there is a centralised internal RAS team at the bank or the INA function assigned the responsibility of assessing the current effectiveness of the department.

RGS are the crucial factors of three lines of defence that affect a bank’s ERM. Therefore, BOD and management must continuously improve organisational governance systems to address critical risks and enhance risk discussions at the strategic level. The BOD and management of banks should accept the bank's risk appetite as a strategy component. The BOD and management must maintain close monitoring of risks at all times. In addition, banks must establish an RIM committee at different levels to measure the ICO.

Finally, since ERM is capability (COSO, 2017) and dynamics (ISO, 2018), HRM practices such as the policy of continuously investing in employee skills and abilities based on growth orientation, remuneration systems are associated with job performance, employees are involved in decision-making activities etc. will contribute to the formation of a dynamic, influential ERM-oriented culture.

Limitations

Limitations of the study are that other crucial factors of the external environment influencing the implementation of ERM by banks have yet to be considered. Furthermore, the demographic variables used still do not highlight the specific attributes of the banking industry, such as capital structure, scale of and scope of business, etc.

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