REVIEW OF BUSINESS AND MANAGEMENT

Theory Methodology Practice

University of Miskolc
Faculty of Economics

Volume 21 Number 2 December 2025
ISSN: 2415-9883 (Online)

THEORY METHODOLOGY PRACTICE

REVIEW OF BUSINESS AND MANAGEMENT

Editorial Board

Faculty of Economics, University of Miskolc, Hungary

ISSN 2415-9883 (Online)

TMP website: https://ojs.uni-miskolc.hu/index.php/tmp/index

THEORY METHODOLOGY PRACTICE

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Faculty of Economics

Volume 21 Number 1 July 2025

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THEORY METHODOLOGY PRACTICE | Review of Business and Management
2025 VOLUME 21 NUMBER 2
https://doi.org/10.18096/TMP.2025.02.01

Navigating Intercultural Market Entry Between Ghana and Hungary: A CAGE Distance Model Approach

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SUMMARY

This study explores intercultural marketing strategies between Ghana and Hungary through the application of the CAGE Distance Model, which categorizes international differences into four dimensions: cultural, administrative, geographic, and economic. The study addresses a significant gap in the literature, as most empirical applications of the CAGE framework focus on Western or Asian contexts, leaving Africa–Eastern Europe business relationships largely unexplored. Key findings reveal that cultural differences shape branding and communication, administrative inconsistencies affect compliance and entry modes, geographic barriers hinder logistics, and economic disparities influence pricing and segmentation. The model proves effective in identifying strategic challenges and guiding internationalisation decisions. The conclusions confirm that distance dimensions significantly impact marketing strategies and that the model is adaptable across emerging and developed markets. Recommendations urge multinational enterprises to conduct in-depth market research, invest in cultural training, and leverage digital tools to overcome barriers.

HOW TO CITE:

Boateng Ohene, G. (2025). Navigating Intercultural Market Entry Between Ghana and Hungary: A CAGE Distance Model Approach. *THEORY METHODOLOGY PRACTICE: Review of Business and Management, 21*(2), 3-20. https://doi.org/10.18096/TMP.2025.02.01

ARTICLE HISTORY
Received 27 July 2025
Revised 11 September 2025
Accepted 9 October 2025
Published 15 October 2025

KEYWORDS
CAGE Distance Model, intercultural marketing, Ghana–Hungary relations, international business, market entry strategies

JEL CLASSIFICATION
F23, M16, M31, F14, O55, P27

1. INTRODUCTION

1.1. Introduction

In today's era of rapid globalisation and digital transformation, companies are increasingly compelled to transcend national borders in search of new market opportunities. The intensification of international trade and investment has created unprecedented challenges and prospects for global enterprises. Central to navigating these complexities is the concept of intercultural marketing—a strategic approach that adapts marketing efforts to accommodate the cultural, administrative, geographic, and economic differences between countries (Copuš & Čarnogurský, 2017; Ghemawat, 2001). For businesses seeking to establish sustainable cross-border operations, particularly in regions with stark cultural and socio-economic disparities such as Ghana and Hungary, understanding and bridging these differences is vital.

Ghana, a rising economic power in West Africa, is characterised by its youthful population, rich cultural heritage, collectivist social structure, and an increasingly digital consumer base (Darley et al., 2008). In contrast, Hungary, located in Eastern Europe and integrated into the European Union, exhibits an individualistic culture shaped by post-communist transitions, robust infrastructure, and market-oriented policies (Vlajcic 2019). These contrasting profiles make the

intercultural business dynamics between Ghana and Hungary an ideal context for evaluating how intercultural distance affects market entry and performance.

The CAGE Distance Model, introduced by Ghemawat (2001), provides a robust framework for analysing these disparities. The model categorises differences between countries into four primary dimensions: cultural, administrative, geographic, and economic (Ghemawat, 2007). Each dimension represents a barrier or opportunity that firms must consider when entering a foreign market. Cultural distance includes variations in language, values, and communication styles; administrative distance refers to differences in legal systems, governance, and institutions; geographic distance involves the physical and logistical challenges of doing business across borders; and economic distance examines discrepancies in income levels, consumer purchasing power, and market maturity (Hofstede, 2010). International marketing requires making plans that take into account variations in culture, economy, law, and customer behaviour (Cateora et al., 2020).

While intercultural marketing frameworks like Hofstede's cultural dimensions and the Uppsala model have been widely applied in international business literature (De Mooij, 2021), the CAGE Distance Model remains underutilised, particularly in African and Eastern European contexts. Most empirical studies have focused on Western or Asian markets, leaving significant gaps in the literature concerning Africa–Eastern Europe business interactions. This study addresses this research void by applying the CAGE Distance Model to the Ghana–Hungary context, offering a unique lens to explore how intercultural distance shapes market entry strategies, consumer engagement, and business performance.

1.1.1. Problem statement

The problem statement underscoring this study posited that, the rise of globalisation has ushered in a new era of business expansion, but it has also magnified the complexity of intercultural differences that firms must navigate. Despite the importance of these challenges, current research reveals significant gaps in our understanding of how intercultural distance—particularly between African and Eastern European nations—affects market entry and marketing strategy. Much of the existing literature centres on Western and Asian economies, overlooking the rich intercultural dynamics between regions like Ghana and Hungary (De Mooij, 2021).

Furthermore, most studies that explore international market entry have focused on individual dimensions of distance, primarily culture, while neglecting the administrative, geographic, and economic aspects that the CAGE model encapsulates. For instance, while Hofstede's model has been instrumental in mapping cultural variances (Hofstede, 2010), it does not adequately address the implications of institutional, logistical, and economic disparities. Similarly, Porter's Five Forces and the PESTEL framework emphasise competitive and macro-environmental factors but fail to capture the nuanced challenges of intercultural adaptation (Kotler & Keller, 2012; Harrison et al., 2001).

Compounding this issue is the limited application of the CAGE Distance Model to marketing strategy development between Ghana and Hungary. Despite the model's ability to elucidate differences in consumer preferences, regulatory regimes, logistics, and economic structures, there is a dearth of studies employing CAGE in this specific intercultural context. As a result, businesses lack empirical insights to effectively tailor their market entry strategies to the distinct demands of Ghanaian and Hungarian markets.

Also missing is research on how digital innovation and technological infrastructure can be used to overcome geographical and cultural distances. Although e-commerce and artificial intelligence have been embraced in both regions, few studies explore how these tools facilitate intercultural marketing between Ghana and Hungary. Similarly, while digital platforms are increasingly used for brand engagement in Ghana, there is insufficient empirical work linking these innovations to the CAGE framework, particularly in terms of addressing geographical and economic barriers. (Acquah et al., 2024),

Another overlooked area is the impact of colour symbolism, religious influence, and language on branding and advertising strategies. While some researchers have addressed colour marketing and cultural values in isolation (Hajdú, 2021), they rarely consider how these cultural markers influence consumer perception and sales performance in intercultural business environments such as Ghana and Hungary.

Additionally, variations in trade regulations, such as the EU's General Data Protection Regulation (GDPR) and Ghana's adherence to the AfCFTA framework, create further complexity. Despite the importance of regulatory differences in administrative distance, comparative studies examining the business implications of these frameworks are lacking (Asiedu, 2013; Brouthers, 2013). This gap leaves firms without a clear roadmap for navigating legal compliance and institutional barriers in their market entry strategies.

1.1.2. Objective

To examine intercultural marketing strategies between Ghana and Hungary using the CAGE Distance Model, in order to identify market entry barriers and recommend strategies for enhancing trade and business performance. The study is guided by the specific objective to: to assess the cultural differences between Ghana and Hungary and their impact on marketing strategies; to examine the administrative and regulatory challenges affecting trade relations between the two

countries; to evaluate the geographical barriers influencing supply chain and distribution networks; to analyse the economic disparities and their effect on consumer purchasing preferences and pricing strategies and to assess the impact of the CAGE model's cultural, administrative, geographic, and economic factors on sales performance between Ghanaian and Hungarian companies.

1.2. Research Questions

1. How do cultural differences between Ghana and Hungary influence marketing strategies?
2. What administrative and regulatory challenges affect trade between Ghana and Hungary?
3. How does geographical distance impact supply chain and logistics between the two countries?
4. In what ways do economic disparities influence consumer purchasing preferences and pricing strategies
5. What is the influence of cultural, administrative, geographic, and economic elements of the CAGE Model on sales success between Ghanaian and Hungarian companies?

2. LITERATURE REVIEW

2.1. The CAGE Distance Model

2.1.1. History, Proponents and Contemporary Contributions of the CAGE Distance Model

The CAGE Distance Model, conceptualised by Pankaj Ghemawat in 2001, was introduced to provide a more nuanced framework for assessing international business expansion, addressing the limitations of traditional economic indicators like GDP. The model categorises distance into four dimensions—Cultural, Administrative, Geographic, and Economic—that shape cross-border operations and market entry strategies (Ghemawat, 2001). Earlier, Beckerman (1956) introduced the idea of psychic distance, focusing on how informational and cultural barriers impact international trade. This evolved through the contributions of Johanson and Vahlne (2009), who connected psychic distance to internationalisation theory, and Hofstede (1980), who provided a structured method for measuring cultural differences.

Building upon these foundations, Ghemawat argued that non-economic factors — especially cultural and administrative differences — are equally significant in determining the success or failure of international ventures (Ghemawat, 2007). Contemporary research continues to support the model's relevance. Berry et al. (2010) enhanced its institutional analysis, while Beugelsdijk et al. (2017) explored its strategic implications. Applications in sectors such as tourism (Shao et al., 2024), FDI (Doanh et al., 2022) and digital commerce (Li, 2025) confirm the model's adaptability in an evolving global landscape.

2.1.2. CAGE Model Application in Similar Studies and Its Extension

The CAGE model has been applied across diverse disciplines, such as tourism (Assaf & Josiassen, 2012), trade efficiency (Le, 2017), expatriate destination selection (Maciel et al., 2020), and export behaviour (Hutzschenreuter et al., 2016). These studies reinforce the model's applicability in examining how distance affects consumer behaviour, firm strategy, and institutional alignment.

Recent extensions address criticisms that the model is static and lacks nuance. Ciulli & Kolk (2023) introduced a temporal dimension, proposing that distance can vary with geopolitical shifts. Verbeke et al. (2018) and Kaartemo & González-Pérez (2020) recommend integrating environmental and technological distances to adapt to the digital economy. This adaptability is crucial when analysing emerging-market interactions, such as between Ghana and Hungary, which are marked by institutional voids and contrasting infrastructural capacities.

2.1.3. Justification and Relevance of the CAGE Model in Intercultural Marketing Between Ghana and Hungary

The Ghana-Hungary bilateral relationship provides a compelling context for applying the CAGE framework. Cultural distinctions, such as Ghana's collectivist ethos and Hungary's individualistic orientation, impact branding and promotional tactics (Hofstede, 2001). Language, religion, and social norms present challenges in communication, necessitating highly localised campaigns (Takyi et al., 2025).

Administratively, Ghana's developing regulatory framework contrasts sharply with Hungary's EU-aligned legal system. This gap influences compliance, market entry modes, and institutional trust (Sambharya & Rasheed, 2015; Fernández et al., 2017). Geographically, although separated by continents, both countries experience infrastructural disparities—Ghana contends with port inefficiencies, while Hungary benefits from EU-grade logistics (World Bank, 2020). Economically, Ghana's lower GDP per capita ($2,400) compared to Hungary's ($17,000+) (World Bank, 2020) affects purchasing power

and pricing strategies. Together, these dynamics justify using the CAGE model to unpack intercultural marketing challenges and opportunities between these two nations.

2.2. CAGE Model Intercultural Marketing Strategies: Implications for Ghana and Hungary

Intercultural marketing strategies must align with the distinct distance dimensions outlined in the CAGE model summarised in Table 1 below.

Culturally, campaigns in Ghana should highlight community well-being and local storytelling, while Hungarian consumers respond to messages of quality and individual benefit (Beugelsdijk et al., 2017). Partnerships with religious or social leaders in Ghana foster trust, whereas collaborations with established brands in Hungary enhance visibility (Falkné 2014; Bosson et al., 2016).

Administratively, firms must adapt to local compliance needs—understanding Ghana's flexible but bureaucratic environment and Hungary's strict adherence to GDPR and EU law (Li, 2025). Joint ventures are more viable in Ghana; wholly owned subsidiaries may suit Hungary better (Tetteh et al., 2023).

Geographically, firms operating in Ghana may decentralise logistics due to weak infrastructure, while Hungary allows centralised warehousing (Doanh et al., 2022). Time zone and climate considerations also impact distribution.

Economically, dynamic pricing is essential. Sachet marketing or bundling products in Ghana makes goods more affordable, while Hungarian consumers may respond better to premium features and innovation. Cross-border teams also require cultural training to build synergy and avoid miscommunication (Hofstede, 2001).

2.3. Criticisms of the CAGE Distance Model and How to Address Them

While the CAGE model remains influential, it has limitations. Critics argue it omits factors such as technology, demography, and environmental constraints (Berry et al., 2010). Shenkar (2001) also critiques the model's assumption of symmetry—suggesting that market entry from Ghana to Hungary involves different challenges than the reverse.

Another issue is the lack of operational guidance—researchers struggle to identify which indicators best quantify each dimension (Cuervo-Cazura & Genc, 2012). Moreover, the model often ignores dynamic institutional changes and informal structures that significantly affect international business (Scott, 1995). Addressing these criticisms, scholars propose integrating real-time data, digitalisation metrics, and institutional theory to enhance the model's empirical utility and contextual accuracy (Verbeke et al., 2018).

2.4. Current State of Knowledge on Intercultural Differences and Intercultural Marketing

2.4.1. Intercultural Communication Styles

Ghana is typically a high-context culture, where meaning is derived from non-verbal cues and shared experiences (Hall, 1976). Storytelling, proverbs, and communal messaging dominate marketing communication (Takyi et al., 2025). Hungary, conversely, operates as a low-context culture, valuing directness and precision in marketing messages.

Digital platforms illustrate these variations. In Ghana, digital advertising often employs symbolic imagery and cultural themes that offer pathways of brand perception and communication of cultural identity abroad to connect with the shared traditions and societal values of customers (Yeboah-Banin & Quaye, 2021). These symbolic imagery and cultural themes provide cue that helps consumers recognise its distinct identity amid numerous choices. As international businesses shift towards corporate branding abroad, they employ these cultural symbols and artefacts as signals to communicate their market values and the associations they wish to establish with consumers and other stakeholders during marketing campaign (Boateng, 2022).

Hungarian campaigns, on the other hand, tend to focus on facts, clarity, and openness. This is in line with what consumers want from marketing communications that help them make smart choices (Alt et al., 2017). This difference shows the cultural aspect of the CAGE model. Ghana's advertising is based on collectivist symbolic appeals, whereas Hungary's is based on clarity, sharing information, and logical persuasion.

2.4.2. Language and Ethnocentrism

Incorporating local dialects in marketing strategies in Ghana significantly improves brand relatability by promoting familiarity, authenticity, and cultural connection. For instance, using local languages such as Twi, Ga, Ewe, or Hausa in advertising significantly improves relatability, making brands appear more personal and culturally aware in Ghana (Takyi et al., 2025). Hungary's homogeneity simplifies messaging but raises the stakes for accurate language use, especially when mixing Hungarian with English (Incze, 2010).

Ethnocentrism also affects consumer preference. Hungarian consumers often favour local products, associating them with quality and national pride (Nassar et al., 2023). Ghanaian consumers may show similar tendencies, particularly in rural areas, emphasising the need for localisation in branding (Asiedu & Opoku-Mensah, 2024).

2.5. Impact of CAGE Model on Sales Performance

In Table 1 each distance dimension influences sales performance. **Cultural distance** affects message reception and brand trust—misalignment reduces engagement and lowers conversion. **The administrative distance** significantly affects firms' investment choices, as they balance regulatory limitations with market opportunities. This balance influences their speed of entry, compliance expenses, local legitimacy, and ultimately, their operational efficiency in sales performance (Chamchati & El Mabrouki, 2025). **Geographic distance** affects delivery timelines, product availability, and responsiveness, which directly affect sales metrics like customer satisfaction and reorder rates. **Economic distance** shapes affordability and willingness to pay—critical in pricing strategy and market segmentation (Ghemawat, 2007).

Table 1

Summary of CAGE Distance Framework: Features, Indicators and Implications

CAGE Dimension	Key Features	Indicators & Influences	Implications for International Business
Cultural Distance	Arises from differences in language, ethnicity, religion, values, norms, societal structures, and traditions (Ghemawat, 2007; Hofstede, 2001)	▪ Language diversity and translation issues ▪ Unique ethnicities and cultural identities ▪ Low social/ethnic connectivity ▪ Diverse religions and belief systems ▪ Absence of trust ▪ Insularity and prioritisation of traditions ▪ Cultural frameworks ▪ Informal institutions affecting ethical behaviour and marketing practices	▪ Cultural distance influences consumers' perceptions of value, brand messaging. ▪ Marketers need to adjust their strategies to align with national cultural contexts. (Miloloža, 2015; Malhotra et al., 2009).
Administrative Distance	Involves political, legal, institutional, and historical factors that define state relationships and market openness (Ghemawat, 2007)	▪ Political instability or hostility ▪ Absence of colonial ties or shared legal systems ▪ Non-membership in common trade or political blocs ▪ Different currencies ▪ Weak or corrupt institutions ▪ No connections to international organisations ▪ Protectionist policies and high trade barriers ▪ Unilateral policies, such as sanctions and tariffs	▪ Administrative barriers deter FDI and limit market attractiveness. ▪ Strong institutions reduce uncertainty and transaction costs, while weak ones increase risk. ▪ Firms may favour joint ventures or alliances in high administrative distance contexts (Li, 2025; Sambharya & Rasheed, 2015).
Geographic Distance	Encompasses not just physical distance, but also infrastructure, topography, logistics, and environmental characteristics (Ghemawat, 2001)	▪ No shared borders ▪ Different time zones and climates ▪ Diverse disease environments ▪ Landlocked or topographically isolated- Poor transport or communication infrastructure ▪ Logistics Performance Index (LPI) ▪ Country size and accessibility	▪ Affects supply chain, distribution strategies, and market entry logistics. ▪ Relevant for fragile or perishable products. ▪ Digital innovations reduce—but do not eliminate—the effects of Geographic barriers (Doanh et al., 2022)

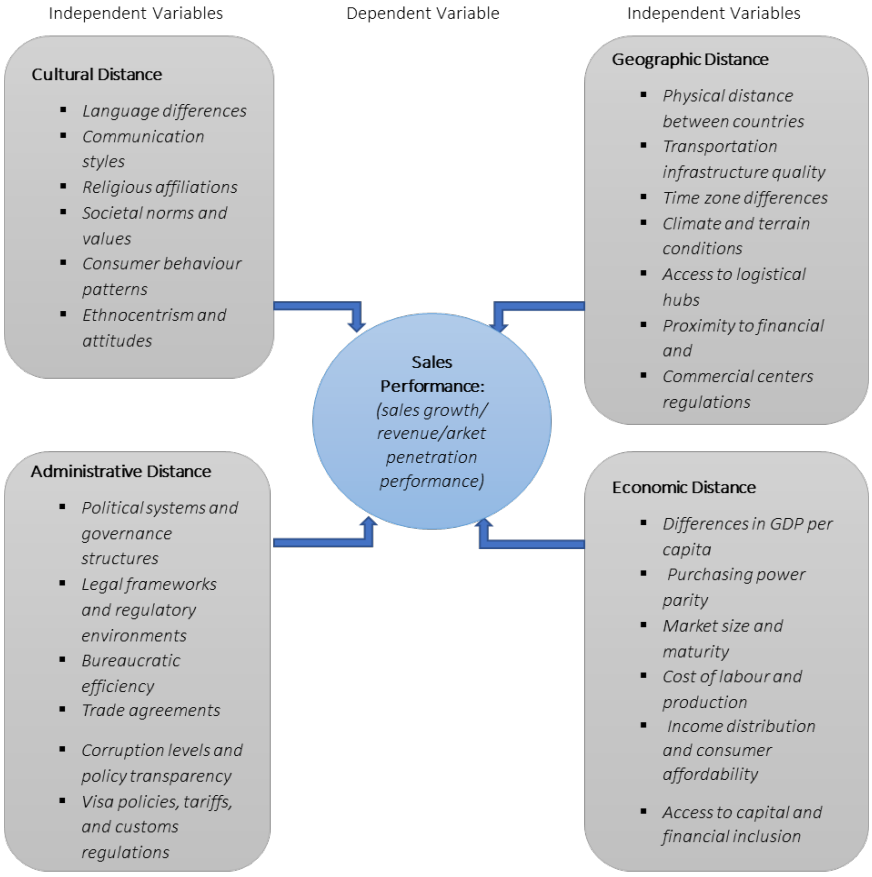
Economic Distance	Refers to differences in consumer income, market size, development level, and access to resources (Li., 2023; Ghemawat, 2001)	▪ GDP per capita disparities- Inflation rates and monetary size- Rich/poor gaps ▪ Unequal resource bases (natural, financial, human) ▪ Weak infrastructure or development index ▪ Varying capital market maturity and information accessibility	▪ Influences pricing, segmentation, and market transferability of business models. ▪ Firms entering markets with high economic distance may face increased costs or adaptation requirements. ▪ However, low-to-moderate economic distance can offer arbitrage benefits (Antunes et al., 2019; Wang et al., 2016; Le, 2017).

Source: Literature Synthesis; Researcher's Construct; (2025)

2.6. Conceptual Model: CAGE Distance and Sales Performance

2.6.1. Conceptual Framework Explanation

Figure 1 illustrates the interrelationships among the CAGE Distance Model variables—Cultural, Administrative, Geographic, and Economic distances—and their collective influence on sales performance in international business between Ghana and Hungary. Cultural distance impacts consumer behaviour, brand perception, and message reception, with language, religion, and societal norms shaping product acceptability. Misalignment can weaken brand trust and reduce sales. Quantitative surveys (e.g., Likert scales) and qualitative interviews will assess these effects relative to sales metrics like repeat purchases.



Source: Researchers' Own Construct, 2025

Figure 1: The interrelationships among the CAGE Distance Model variables

Administrative distance covers institutional differences such as legal systems, political environments, and trade regulations. High administrative barriers can delay operations, raise compliance costs, and hinder trade, impacting sales outcomes. Data on perceived regulatory challenges will be compared with trade delay frequencies and logistical inefficiencies. Geographic distance includes physical separation, infrastructure, and time zones, affecting delivery speed, communication, and customer satisfaction. Metrics like shipping delays and infrastructure ratings will be analysed against customer retention and distribution costs.

Economic distance reflects differences in income levels and purchasing power, which influence pricing and product positioning. Sales performance will be linked to GDP, market size, and affordability indices. Altogether, the CAGE dimensions critically shape trade and marketing success, with reduced intercultural distance correlating with improved international sales outcomes.

3. MATERIALS OR METHODS

3.1. Introduction

Building on the body of knowledge examined and gaps found, this chapter describes the analytical approach applied to examine the effect of cultural, administrative, physical, and financial distance on intercultural marketing between Ghana and Hungary. This work adds especially to scholarly understanding by using the CAGE Distance Model in a bi-regional setting with little scholarly attention paid to it. Through a focus on trade and marketing dynamics between Sub-Saharan Africa and Eastern Europe—more especially, Ghana and Hungary—this study provides fresh empirical insights on how digital adaptation and cultural barriers affect marketing performance.

3.2. Research Design

This research adopts a qualitative, theory-informed, and interpretive design, relying entirely on secondary literature review as its method of inquiry. The methodological orientation is aligned with the pragmatist philosophy, which holds that the most appropriate methods are those that help answer the research questions in meaningful ways (Morgan, 2007). In this case, the use of secondary sources and integrative review methods provides the most practical path to understanding the complex intercultural realities influencing marketing between Ghana and Hungary.

The CAGE Distance Model (Ghemawat, 2001), which systematically categorizes international differences into cultural, administrative, geographic, and economic distances, serves as the conceptual backbone of the study. Each of these four dimensions serves as an analytical category through which relevant findings from existing literature are mapped and interpreted.

The decision to focus solely on secondary data is grounded in both practical constraints and epistemological considerations. Intercultural marketing between Ghana and Hungary is a niche area where direct access to participants and primary data is limited. Additionally, the COVID-19 pandemic, global geopolitical tensions, and differing legal data protection regimes in the EU and West Africa have increased the barriers to fieldwork.

Equally important is the acknowledgment that **a vast and rich body of literature already exists**—ranging from peer-reviewed academic studies and global development reports to industry white papers and governmental policy evaluations. These sources contain valuable insights that, when systematically analyzed, can offer reliable and actionable conclusions.

3.3. Data Collection Method

This study collects data exclusively through a **systematic literature review**. The literature is selected from peer-reviewed journals, books, working papers, government reports, multinational databases (e.g., World Bank, WHO, UNCTAD), and websites of Disabled People's Organizations (DPOs), trade ministries, and marketing agencies in both Ghana and Hungary. Sources are selected using predefined inclusion criteria:

- Relevance to cultural, administrative, geographic, or economic dimensions of international business.
- Focus on Ghana, Hungary, or similar emerging/developed country pairs.
- Published within the past 20 years, with exceptions for foundational models.
- Authored by recognized institutions or scholars.

The literature review is not merely a narrative synthesis but a **structured analytic process** aimed at drawing relationships between distance dimensions and marketing outcomes. Special attention is paid to grey literature from sources like UNICEF, WHO, the World Bank, and DPO reports to capture marginalized perspectives—including those of people with disabilities or ethnic minorities whose consumer behavior is often underrepresented.

3.4. Data Analysis Strategy

The core of the methodology lies in a **thematic content analysis** informed by the Braun and Clarke (2006) framework, with each theme aligned with one of the CAGE dimensions. Here's how the process unfolds:

1. **Familiarization**: The researcher reviews over 120 sources spanning academic, institutional, and corporate domains. This stage identifies preliminary ideas and recurring terms like "cultural resistance," "regulatory uncertainty," or "cost-distance sensitivity."
2. **Generating Codes**: Key concepts are coded using NVivo software and manually validated. Codes include "language adaptation," "governance efficiency," "logistics complexity," and "consumer affordability."
3. **Developing Themes**: Codes are grouped into overarching themes representing the four CAGE categories. For example, "language barriers" and "advertising norms" are classified under Cultural Distance, while "customs delays" and "EU policy misalignment" fall under Administrative and Geographic Distance.
4. **Mapping and Interpretation**: A conceptual map links themes to outcomes like sales performance, consumer acceptance, or brand trust. Thematic intersections (e.g., how administrative and cultural distance co-determine product localization) are explored in depth as indicated in Table 2 below.
5. **Critical Synthesis**: Literature is not treated passively. The researcher critically assesses how applicable, outdated, or contested certain findings are—particularly across contexts like Africa and Eastern Europe.

This analytic approach allows the study to extract both generalizable insights and culturally specific nuances, thereby answering all five research questions outlined in Chapter One.

3.5. Application of the CAGE Framework

Each distance category is used as a **meta-theme** to structure the interpretation of findings. For instance:

- **Cultural Distance**: Includes factors like language differences, religious diversity, consumer behavior, and advertising symbolism. The study incorporates findings from Takyi et al. (2025), Hofstede (2010), and Denzin and Lincoln (2011), while also noting underrepresented experiences from women, youth, and people with disabilities in branding messages.
- **Administrative Distance**: Looks at governance, legal systems, trade agreements, and policy execution. Literature from World Bank (2020), Berry et al. (2010), and Asiedu (2013) offer comparative insights on how different bureaucratic environments affect market entry decisions.
- **Geographic Distance**: Considers physical distance, logistics infrastructure, and transportation costs. Reports from the Halaszovich and Kinra (2020) and Ojala & Tyrväinen, (2007) are instrumental here.
- **Economic Distance**: Assesses GDP disparities, income distribution, cost sensitivity, and digital readiness. Sources like De Mooij (2021), and Ghauri and Cateora (2021) are critically engaged.

Table 2

Mapping each research question to the appropriate CAGE dimension, data source, and analytical method

Research Question	CAGE Dimension	Data Source	Analytical Method
How do cultural differences between Ghana and Hungary influence marketing strategies?	Cultural Distance ▪ *Language differences* ▪ *Communication styles (high-context vs. low-context)* ▪ *Religious affiliations* ▪ *Societal norms and values* ▪ *Consumer behaviour patterns* ▪ *Ethnocentrism and attitudes towards foreign brands:*	▪ Secondary data	▪ Content Analysis

What administrative and regulatory challenges affect trade between Ghana and Hungary?	Administrative Distance ▪ *Political systems and governance structures* ▪ *Legal frameworks and regulatory environments* ▪ *Bureaucratic efficiency* ▪ *Trade agreements or alliances (e.g., EU, ECOWAS)* ▪ *Corruption levels and policy transparency* ▪ *Visa policies, tariffs, and customs regulations*	▪ Government reports (EU, AfCFTA, ECOWAS) ▪ Trade policy documents ▪ Expert interviews	▪ Content analysis; ▪ Comparative policy review
How does geographical distance impact supply chain and logistics between the two countries?	Geographic Distance ▪ *Physical distance between countries* ▪ *Transportation infrastructure quality* ▪ *Time zone differences* ▪ *Climate and terrain conditions* ▪ *Access to ports or logistical hubs* ▪ *Proximity to financial and commercial centres*	▪ World Bank Logistics Performance Index	▪ Content Analysis
In what ways do economic disparities influence consumer purchasing preference and pricing strategies?	Economic Distance ▪ *Differences in GDP per capita* ▪ *Purchasing power parity* ▪ *Market size and maturity* ▪ *Cost of labour and production* ▪ *Income distribution and consumer affordability* ▪ *Access to capital and financial inclusion*	▪ Analysis of National statistics (Ghana Statistical Service, Eurostat Data)	▪ Content Analysis
What is the influence of cultural, administrative, geographic, and economic elements of the CAGE Model on sales success between Ghanaian and Hungarian companies?	All (CAGE composite)	▪ Integrated data from above	▪ Content Analysis

Source: Researchers Own Construct, 2025

3.6. Research Validity and Reliability

Establishing validity and reliability is essential for upholding the credibility of any research endeavour. Validity pertains to how well the research truly represents the concept it aims to measure (Heale & Twycross, 2018). In this study, the researcher made sure our main factors—cultural, administrative, geographic, and economic distances—matched up with strong theories, especially Ghemawat's (2001) CAGE Distance Framework. Each dimension was defined through subvariables acknowledged in current intercultural marketing literature (Beugelsdijk et al., 2017; Hofstede, 2010).

The robustness of internal validity was enhanced through the triangulation of data gathered from various sources, such as secondary trade reports, and published academic studies. This approach to using multiple methods helps mitigate

bias and improves the reliability of conclusions about how intercultural distance affects trade performance between Ghana and Hungary. The study took into account external validity or generalisability by choosing participants from various backgrounds within the trade sectors of both Ghana and Hungary. This approach aims to ensure that the findings can be applied to wider intercultural marketing scenarios that include other nations in Africa and Eastern Europe (Saunders et al., 2019).

3.6.1. Reliability

Reliability pertains to the degree of consistency and repeatability observed in research findings (Bartlett et al., 2008). This study established instrument reliability through the use of standardised by implementing systematic coding procedures for the qualitative data collected. A team of coders examined the interview transcripts on their own, and any differences in their interpretations were addressed through discussion and agreement, ensuring a unified understanding of the data. Additionally, employing the CAGE framework as a theoretical guide enhances the reliability of the research, as it offers a solid conceptual foundation that has been rigorously tested and refined in numerous studies on global trade (Doanh et al., 2022). The implementation of these measures guarantees that the results of the research can be reliably reproduced and are credible.

3.7. Ethical Considerations

Although no primary data are collected, ethical standards still apply. The research ensures full transparency by citing all data sources accurately. Special care is taken to avoid misrepresentation of marginalised groups, particularly people with disabilities and children. In discussing disability-related themes, the study references DPO-authored content and prioritises their lived experiences, respecting the principle of "nothing about us without us. “Additionally, the study considers data from global health bodies such as WHO and UNICEF, especially regarding gender-sensitive programming and inclusion. The intention is not only to critique gaps but to propose culturally respectful strategies that foster equity in intercultural marketing between Ghana and Hungary.

4. DISCUSSION OF MAIN FINDINGS AND THEIR RELATION TO THE REVIEWED LITERATURE

4.1. Research Findings based on synthesis of Literature

This research centers on the application of the **CAGE Distance Framework** (Cultural, Administrative, Geographic, and Economic distances) to understand intercultural marketing challenges and opportunities between **Ghana and Hungary**. Synthesizing the reviewed literature and empirical contexts, several core findings emerged:

4.1.1. Cultural Distance as a Foundational Barrier and Opportunity

Cultural differences—language, values, social norms, and religious beliefs—shape market entry decisions and marketing strategy design. Ghana’s collectivist culture contrasts with Hungary’s individualist orientation, affecting brand messaging and consumer engagement strategies. The diversity of local dialects in Ghana and Hungary's unique language system underscore the need for deep localisation as indicated in Table 3 below.

Table 3

Finding Summary: Implications of Cultural Distance (Ghana–Hungary)

Cultural Factor	Ghana	Hungary	Strategic Implication
Language	Multilingual (English + 80+ local dialects)	Hungarian (isolated, non-Indo-European)	Requires deep localisation of language and idiomatic adaptation for effective communication.
Values and Norms	Collectivist, community-oriented	Individualistic, achievement-driven	Ghana: community-centric campaigns. Hungary: focus on personal success and self-expression.

Religion	Religiously devout (Christianity + Islam)	Predominantly Christian with growing secularism	Ghana: religiously sensitive marketing. Hungary: secular, modern storytelling preferred.

Source: Researcher's Construct; (2025)

4.1.2. Administrative Distance Determines Market Access and Regulatory Strategy

The administrative environment in Ghana, marked by regulatory inconsistencies and higher corruption perception, poses more obstacles compared to Hungary's EU-aligned legal and trade systems. These differences influence not only the preferred entry modes (joint ventures in Ghana vs. subsidiaries in Hungary) but also pricing, branding, and compliance strategies (see Table 4 below).

Table 4

Finding Summary- Administrative Distance Implications (Ghana–Hungary)

Administrative Factor	Ghana	Hungary	Strategic Implication
Regulatory Framework	Evolving, with corruption and inefficiency concerns (World Bank, 2020)	Stable EU-aligned regulations (Fernández et al., 2017)	Ghana: Partner with locals, navigate bureaucracy. Hungary: More direct and standardised entry models.
Trade Policy	Member of ECOWAS; bilateral trade agreements with non-African states	EU member; unified trade policies with major economies	Ghana: Adapt to fragmented rules. Hungary: Leverage EU trade provisions.
Legal System	Common law system; inconsistent enforcement	Civil law system; efficient judiciary	Ghana: Use flexible legal strategies. Hungary: Rely on formal contracts.
Currency and Financial Regulation	Cedi (GHS), prone to volatility	Forint (HUF), relatively stable under EU guidance	Ghana: Mitigate exchange risks. Hungary: Greater financial predictability.

Source: Researcher's Construct; (2025)

4.1.3. Geographic Distance Impacts Distribution and Supply Chain Efficiency

While Hungary benefits from EU-centric infrastructure and access, Ghana's infrastructural limitations (such as poor roads and port inefficiencies) elevate transaction costs. However, digital transformation is gradually neutralizing physical distance, especially for services and digital goods- see Table 5 below.

Table 5

Finding Summary: Geographic Distance Implications (Ghana–Hungary)

Geographic Factor	Ghana	Hungary	Strategic Implication
Logistics Infrastructure	Developing, fragmented road and rail systems	Advanced, integrated multimodal logistics	Ghana: Localised distribution hubs needed. Hungary: Centralised systems feasible.
Physical Distance	West Africa, maritime access with logistical challenges	Central Europe, EU-integrated transport routes	Ghana: Longer transit times and customs complexities. Hungary: Shorter delivery windows and EU harmonisation.
Market Accessibility	Growing urban centres, difficult rural access	High urban concentration, accessible towns	Ghana: Tiered segmentation for urban/rural. Hungary: More homogeneous access model.
Topography & Climate	Diverse terrain, tropical, weather-disrupted routes	Flat terrain, temperate climate	Ghana: Adaptive, resilient logistics. Hungary: Predictable transport systems.

LPI and Coordination	Lower LPI, time zone barriers	High LPI, CET alignment	Ghana: Slower and costlier operations. Hungary: Efficient, real-time coordination possible.

Source: Researcher's Construct, 2025

4.1.4. Economic Distance Influences Market Segmentation and Entry Timing

Disparities in GDP per capita, inflation rates, and institutional development affect how firms assess the feasibility of entering either country. Ghana's emerging market dynamics attract cost-sensitive foreign investments, whereas Hungary appeals with its stability and EU access. These economic variations dictate pricing models, investment scale, and consumer targeting strategies as indicated in Table 6 below.

Table 6

Findings Summary: Economic Distance Implications (Ghana–Hungary)

Economic Factor	Ghana	Hungary	Strategic Implication
Income Levels	Lower-middle income; price-sensitive consumers	Upper-middle income; value-driven consumers	Ghana: Cost leadership strategies. Hungary: Differentiation and brand loyalty approaches.
Market Size & Growth	Large, young, growing population	Small, ageing, stable population	Ghana: Expansion and penetration. Hungary: Retention and innovation.
Inflation & Currency	Higher inflation, Cedi (GHS) volatility	Moderate inflation, Forint (HUF) stability	Ghana: Dynamic pricing and currency hedging. Hungary: Long-term financial planning.
Infrastructure & Capital Markets	Limited infrastructure; informal finance prevalent	Strong infrastructure; access to formal capital	Ghana: Hybrid models using local intermediaries. Hungary: Scalable digital and institutional strategies.

Source: Researcher's Construct, 2025

4.1.5. CAGE Model Application Enhances Strategic Alignment

The study finds the CAGE framework to be effective in diagnosing distance-related challenges, guiding firms toward appropriate internationalisation strategies. The model is also extensible, with recent academic suggestions to include **technological, institutional, and environmental distances** to suit modern digital and sustainability concerns.

4.1.6. Empirical Evidence Validates Framework Relevance

Case studies across trade, tourism, and FDI in the literature reinforce the model's usefulness in varied sectors. Findings indicate that greater perceived distances often result in preference for cooperative modes like alliances, while low-distance markets attract direct investment.

5. CONCLUSIONS

Based on the synthesis of the CAGE model's components and their empirical application between Ghana and Hungary, the study achieves its objectives in the following ways:

5.1. To Identify and Analyse Intercultural Marketing Challenges

The study successfully identifies core cultural and administrative mismatches, such as language incongruence, differing value systems, and varied institutional robustness, all of which pose significant challenges for marketers.

5.2. To Assess the Impact of Distance on Market Entry Strategy

Findings confirm that cultural and administrative distances heavily influence entry mode decisions. For instance, firms entering Ghana may prefer joint ventures due to administrative uncertainty, while Hungary's predictable regulatory framework allows for wholly owned subsidiaries.

5.3. To Examine Strategic Responses to Distance Barriers

The study outlines actionable strategies for mitigating CAGE-based challenges, such as adapting marketing content to local cultural contexts, aligning regulatory practices, and utilising digital channels to overcome geographic limitations.

5.4. To Validate the Applicability of the CAGE Framework in Emerging and Developed Markets

The dual-context application (Ghana as an emerging market and Hungary as a developed, EU-integrated economy) confirms the framework's flexibility and analytical robustness across different economic settings.

Based on the conclusions based on the synthesis of the literature the following recommendations are suggested:

1) For Multinational Enterprises (MNEs):
    - Prioritise **market-specific research** to assess all four CAGE dimensions before expansion.
    - Invest in **cultural training and local partnerships** in high-distance countries like Ghana.
    - Leverage **digital platforms** to mitigate geographic and administrative barriers, especially for service-based industries.
2) For Policy Makers in Ghana and Hungary:
    - Ghana should work on **reducing bureaucratic bottlenecks** and improving infrastructure to attract more FDI.
    - Hungary can further strengthen digital trade laws to become a preferred digital business hub within the EU.
    - Both governments can promote **bilateral agreements** to reduce administrative and economic distances.
3) For Academic Researchers:
    - Future studies should consider expanding the CAGE framework with variables such as **environmental regulation distance**, **digital readiness**, and **technological infrastructure**.
    - There's room for **quantitative testing** of the CAGE dimensions in other regional dyads (e.g., Africa–Asia, or Latin America–Europe) to broaden the scope of comparative insights.

6. CONTRIBUTION OF THE STUDY

This research contributes significantly to international business literature and intercultural marketing practice in several key ways:

6.1. Contextual Application of the CAGE Model

By applying the model specifically to Ghana and Hungary, the study offers practical insights into the interplay between emerging and developed markets. This country-pair specificity fills a gap in existing literature where most prior applications focused on Western-centric contexts.

6.2. Extension of Theoretical Boundaries

The study reinforces the call for dynamic and flexible interpretations of distance—particularly in light of digitisation and geopolitical shifts. It aligns with scholars like Cuypers et al. (2022) who argue for the temporal and contextual evolution of distance variables.

6.3. Managerial Framework for Intercultural Marketing

The study proposes actionable managerial recommendations grounded in empirical and theoretical evidence. This adds practical value by helping firms tailor their internationalisation and marketing strategies to the nuances of diverse markets.

6.4. Advancing the Dialogue on Intercultural Business Strategy

By focusing on the unique Ghana–Hungary dyad, the study enhances our understanding of South-North intercultural marketing relationships and sheds light on how businesses can craft culturally sensitive and administratively compliant marketing campaigns.

6.5. Relevance to Digital and Emerging Economies

The study acknowledges the rising importance of digital innovation and economic decentralisation, positioning the CAGE model as a relevant tool not only for traditional FDI but also for e-commerce, tech trade, and knowledge exchange across borders.

This research reaffirms the value of the **CAGE Distance Framework** in diagnosing and addressing intercultural marketing challenges. The findings demonstrate that while distance still matters in global business, a nuanced understanding of its dimensions—especially in contexts like Ghana and Hungary—can lead to more informed strategy, better market alignment, and increased international success. The study serves as a timely reminder that global expansion requires not only economic rationale but also cultural empathy, institutional insight, and strategic adaptability.

Acknowledgment

The author would like to thank anonymous reviewers for their supportive comments and suggestions.

Disclosure statement

No potential competing interest to declare by the authors.

Funding

The author received no direct funding for this research.

Data availability statement

Data available on request due to privacy, from the author: **George Boateng Ohene** kwesi6000@gmail.com

REFERENCES

Acquah, A., Agyabeng, A. N., & Mensah, J. K. (2024). Digital transformation and implications for the informal sector of Ghana. In *Informal Economy and Sustainable Development Goals: Ideas, Interventions and Challenges* (pp. 29-51). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83753-980-220241002

Antunes, I. C. M., Barandas, H. G., & Martins, F. V. (2019). Subsidiary strategy and managers' perceptions of distance to foreign markets. *Review of International Business and Strategy, 29*(3), 198–216. https://doi.org/10.1108/RIBS-01-2019-0007

Alt, M. A., Săplăcan, Z., & Berács, J. (2017). Social responsibility in bank communication with customers before the economic crisis – The case of Swiss franc loans in Hungary and Romania. *Journal of East European Management Studies, 22*(3), 289–317. https://doi.org/10.5771/0949-6181-2017-3-289

Asiedu, E. (2013). Foreign direct investment, natural resources and institutions. *International Growth Centre Working Paper*. https://www.theigc.org/sites/default/files/2014/09/Asiedu-2013-Working-Paper.pdf

Asiedu, C. Y., & Opoku-Mensah, S. (2024). *Perception and attitude of consumer patronage of Ghana-grown rice: Evidence from Kumasi, Ghana*. *African Journal of Consumer Studies, 2*(1), 15–29. https://doi.org/10.54834/ajcs.v2i1.123 https://ijcsacademia.com/index.php/journal/article/view/123

Assaf, A. G., & Josiassen, A. (2012). Identifying and ranking the determinants of tourism performance: A global investigation. *Journal of Travel Research, 51*(4), 388–399. https://doi.org/10.1177/0047287511426337

Bartlett, J. W., & Frost, C. (2008). Reliability, repeatability and reproducibility: analysis of measurement errors in continuous variables. *Ultrasound in obstetrics & gynecology*, *31*(4), 466-475. https://doi.org/10.1002/uog.5256

Berry, H., Guillén, M. F., & Zhou, N. (2010). An institutional approach to cross-national distance. *Journal of International Business Studies, 41*(9), 1460–1480. https://doi.org/10.1057/jibs.2010.28

Beugelsdijk, S., Kostova, T., & Roth, K. (2017). An overview of Hofstede-inspired country-level culture research in international business since 2006. *Journal of International Business Studies, 48*(1), 30–47. https://doi.org/10.1057/s41267-016-0038-8

Beckerman, W. (1956). Distance and the pattern of intra-European trade. *The Review of Economics and Statistics, 38*(1), 31–40. https://doi.org/10.2307/1925556

Boateng, S. L. (2022). Leveraging cultural artifacts in corporate branding in a developing economy. In T. Anning-Dorson, S. L. Boateng, & R. Boateng (Eds.) *Delivering Distinctive Value in Emerging Economies* (pp. 153–170). New York: Productivity Press. https://doi.org/10.4324/9781003152217-11

Bosson, E., Boolaky, M., & Gungaphul, M. (2016). The influence of national culture on marketing strategies in Africa. *Journal of Business Administration Research*, *5*(2), 83-100. https://doi.org/10.5430/jbar.v5n2p83

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brouthers, K. D. (2013). Institutional, cultural and transaction cost influences on entry mode choice and performance. *Journal of International Business Studies, 44*(1), 1–13. https://doi.org/10.1057/jibs.2012.23

Cateora, P. R., Gilly, M. C., & Graham, J. L. (2020). *International marketing* (18th ed.). McGraw-Hill Education.

Chamchati, O., & El Mabrouki, M. N. (2025). Revisiting the CAGE Model: An application for entry mode choices in Intra-African internationalization. *Thunderbird International Business Review, 67*(6), 723-738. https://doi.org/10.1002/tie.70008

Ciulli, F., & Kolk, A. (2023). International Business, digital technologies and sustainable development: Connecting the dots. *Journal of World Business*, *58*(4), 101445. https://doi.org/10.1016/j.jwb.2023.101445

Copuš, L., & Čarnogurský, K. (2017). Intercultural marketing: Culture and its influence on the efficiency of Facebook marketing communication. *Management & Marketing. Challenges for the Knowledge Society, 12*(2), 241–254. https://doi.org/10.1515/mmcks-2017-0012

Cuervo Cazurra, A., & Genc, M. (2012). Categories of distance and international business research. In G. Wood, & M. Demirbag (Eds.) *Handbook of Institutional Approaches to International Business* (pp. 219-235). Cheltenham: Edward Elgar Publishing Limited.

Cuypers, I. R. P., Patel, C., Ertug, G., Li, J., & Cuypers, Y. (2022). Top management teams in international business research: A review and suggestions for future research. *Journal of International Business Studies, 53*, 481-515. https://doi.org/10.1057/s41267-021-00456-9

Darley, W. K., & Blankson, C. (2008). African culture and business markets: implications for marketing practices. *Journal of Business & Industrial Marketing*, *23*(6), 374-383. https://doi.org/10.1108/08858620810894427

De Mooij, M. (2021). *Global marketing and advertising: Understanding cultural paradoxes* (6th ed.). London: SAGE Publications Ltd.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. London: Sage Publications Ltd.

Doanh, N. K., Truong, L. T., & Heo, Y. (2022). Impact of institutional and cultural distances on ASEAN's trade efficiency. *Journal of Economic Studies, 49(*1), 77-94. https://doi.org/10.1108/JES-07-2020-0343

Fernández Moriana, V., Vida, A. M., & De Lombaerde, P. (2017). The European Commission single market scoreboard. In P. De Lombaerde, & E. J. S. Acosta (Eds.) *Indicator-Based Monitoring of Regional Economic Integration: Fourth World Report on Regional Integration* (pp. 3-26). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-50860-3_1

Falkné Bánó, K. (2014). Identifying Hungarian cultural characteristics in Europe's cultural diversity in the 21st century: a controversial issue. In *Alkalmazott tudományok I. fóruma: Konferenciakötet* (pp. 17-28). Budapest: Budapesti Gazdasági Főiskola. https://publikaciotar.uni-bge.hu/id/eprint/209/

Ghauri, P., & Cateora, P. (2021). *International marketing* (5th ed.). London: McGraw Hill Education.

Ghemawat, P. (2001). Distance still matters: The hard reality of global expansion. *Harvard Business Review, 79*(8), 137–147.

Ghemawat, P. (2007). *Redefining global strategy: Crossing borders in a world where differences still matter*. Harvard Business Press.

Hajdú, N. (2021). Importance of colour marketing in the evolutive marketing concept. *Multidisciplinary Sciences, 11*(5), 978. https://doi.org/10.35925/j.multi.2021.5.31

Halaszovich, T. F., & Kinra, A. (2020). The impact of distance, national transportation systems and logistics performance on FDI and international trade patterns: Results from Asian global value chains. *Transport Policy*, *98*, 35-47. https://doi.org/10.1016/j.tranpol.2018.09.003

Hall, E. T. (1976). *Beyond culture*. Anchor Books.

Heale, R., & Twycross, A. (2018). Validity and reliability in quantitative research. *Evidence Based Nursing, 18*(3), 66–67. https://doi.org/10.1136/eb-2015-102129

Harrison, J. S., Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (2001). Resource complementarity in business combinations: Extending the logic to organizational alliances. *Journal of Management, 27*(6), 679–690. https://doi.org/10.1177/014920630102700605

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA.: Sage.

Hofstede, G. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). McGraw Hill. https://cmc.marmot.org/Record/.b35262138?utm

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values.* Beverly Hills, CA: Sage.

Hutzschenreuter, T., Kleindienst, I., & Lange, S. (2016). The concept of distance in international business research: A review and research agenda. *International Journal of Management Reviews*, *18*(2), 160-179. https://doi.org/10.1111/ijmr.12065

Incze, E. (2010). *Hungarian multinationals: A time-based perspective of firm internationalization in a transformational country context* (Doctoral dissertation). Corvinus University of Budapest. Corvinus University Repository. http://phd.lib.uni-corvinus.hu/607/2/Incze_Emma_end.pdf

Johanson, J., & Vahlne, J.-E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies, 40*(9), 1411–1431. https://doi.org/10.1057/jibs.2009.24

Kaartemo, V., & González-Pérez, M. A. (2020). Renewable energy in international business. *Critical Perspectives on International Business, 16*(4), 325-336. https://doi.org/10.1108/cpoib-08-2019-0062

Kotler, P., & Keller, K. L. (2012). *Marketing management* (14th ed.). Pearson.

Le, T. H. (2017). Does economic distance affect the flows of trade and foreign direct investment? Evidence from Vietnam. *Cogent Economics & Finance*, *5*(1), 1403108. https://doi.org/10.1080/23322039.2017.1403108

Li, Y. (2025). Revisiting the springboard perspective: Market-seeking internationalization, dynamic capabilities, and digital transformation of emerging market firms. *Management and Organization Review*, 1-28. https://doi.org/10.1017/mor.2025.10

Maciel, C. O., Silva, M. T., & Strehlau, S. (2020). Cultural distance and expatriate destination selection: Insights from the CAGE framework. *RAE–Revista de Administração de Empresas, 60*(1), 39–52. https://doi.org/10.1590/S0034-759020200106

Malhotra, S., Sivakumar, K., & Zhu, P. (2009). Distance factors and target market selection: the moderating effect of market potential. *International marketing review*, *26*(6), 651-673. https://doi.org/10.1108/02651330911001332

Miloloža, H. (2015). Differences between Croatia and EU candidate countries: the CAGE distance framework. *Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy*, *6*(2), 52-62. https://doi.org/10.1515/bsrj-2015-0011

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications. *Journal of Mixed Methods Research, 1*(1), 48–76. https://doi.org/10.1177/2345678906292462

Nassar, S., Tóth, Z. N., & Vasa, L. (2023). Economic empowerment as a result of achieving SDGs with resource access: A comparative research between Gaza Strip and Hungary. *Journal of International Studies, 16*(2), 9-33. https://doi.org/10.14254/2071-8330.2023/16-2/1

Ojala, A., & Tyrväinen, P. (2007). Market entry and priority of small and medium-sized enterprises in the software industry: An empirical analysis of cultural distance, geographic distance, and market size. *Journal of International Marketing*, *15*(3), 123-149. https://doi.org/10.1509/jimk.15.3.123

Sambharya, R. B., & Rasheed, A. A. (2015). Does economic freedom in host countries lead to increased foreign direct investment? *Competitiveness Review, 25*(1), 2–24. https://doi.org/10.1108/CR-05-2013-0047

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Scott, W. R. (1995). *Institutions and organizations.* Thousand Oaks, CA: Sage Publications.

Shao, Y., Huang, S. S., Huo, T., Huang, R., & Li, Z. (2024). Impact of psychic distance stimuli on international tourist flows: A cross-country analysis. *Journal of Destination Marketing & Management*, *32*, 100853. https://doi.org/10.1016/j.jdmm.2024.100853

Shenkar, O. (2001). Cultural distance revisited: Towards a more rigorous conceptualization and measurement of cultural differences. *Journal of International Business Studies, 32*(3), 519–535. https://doi.org/10.1057/palgrave.jibs.8490982

Takyi, S. A., Owusu, J., Korsah, L. A., Issaka, A., Boateng, P. A., & Owusu-Yeboah, E. (2025). Investigating the effect of cultural influences and consumer behaviour on product branding in the manufacturing sector in Ghana. *IOSR Journal of Business and Management, 27*(1 Series 3), 1–8. https://doi.org/10.9790/487X-2701030108

Tetteh, M. O., Chan, A. P., Mohandes, S. R., & Agyemang, D. Y. (2023). Diagnosing critical barriers to international construction joint ventures success in the developing country of Ghana. *Construction Innovation*, *23*(5), 1151-1185. https://doi.org/10.1108/CI-01-2022-0021

Verbeke, A., Coeurderoy, R., & Matt, T. (2018). The future of international business research on corporate globalization that never was… *Journal of International Business Studies, 49*(9), 1101–1112. https://doi.org/10.1057/s41267-018-0192-2

Vlajcic, D., Marzi, G., Caputo, A., & Dabic, M. (2019). The role of geographical distance on the relationship between cultural intelligence and knowledge transfer. *Business Process Management Journal*, *25*(1), 104-125. https://doi.org/10.1108/BPMJ-05-2017-0129

Wang, Y., Gunasekaran, A., Ngai, E. W. T., & Papadopoulos, T. (2016). Big data analytics in logistics and supply chain management: Certain investigations for research and applications. *International Journal of Production Economics, 176,* 98–110. https://doi.org/10.1016/j.ijpe.2016.03.014

World Bank. (2020). *Doing business 2020: Comparing business regulation in 190 economies*. World Bank Group. https://doi.org/10.1596/978-1-4648-1440-2

Yeboah-Banin, A. A., & Quaye, E. S. (2021). Pathways to global versus local brand preferences: The roles of cultural identity and brand perceptions in emerging African markets. *Journal of Global Marketing, 34*(2), 115–132. https://doi.org/10.1080/08911762.2021.1886385

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THEORY METHODOLOGY PRACTICE | Review of Business and Management
2025 VOLUME 21 NUMBER 2
https://doi.org/10.18096/TMP.2025.02.02

Branding Strategies and Sales Volume of Nestle Products: A Nigeria University Experience

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SUMMARY

Building a strong brand is no longer an easy endeavor, it demands strategic prowess. Hence, branding strategies and sales volume of nestle products in Nigeria university was investigated. Specifically, it examined brand awareness and loyalty on customer patronage, and purchase decision respectively. Descriptive survey was adopted using questionnaire to examine a sample of 342 students who are customers of Nestle products. The obtained data was analyzed using SPSS. The study revealed that brand awareness and loyalty significantly affect customer patronage and purchase decision respectively with R2 of 59.1%, and 70.1, both p-values<0.000. It concluded that branding strategy is significant to sales volume. It recommended that managers showed focus on brand strategies to boost sales volume. This implies that investing in brand awareness and loyalty is a strategic imperative that converts above 59% of branding efforts directly into sales revenue.

HOW TO CITE:

Balogun, E. O., & Babawale, O. E. (2025). Branding Strategies and Sales Volume of Nestle Products: A Nigeria University Experience. *THEORY METHODOLOGY PRACTICE: Review of Business and Management, 21*(2), 21-33. https://doi.org/10.18096/TMP.2025.02.02

ARTICLE HISTORY
Received 25 March 2025
Revised 18 June 2025
Accepted 06 October 2025
Published 20 October 2025

KEYWORDS
Branding strategies, sales volume, brand awareness, brand loyalties, customer patronage

JEL CLASSIFICATION
M370

1. INTRODUCTION

In the complex and dynamic landscape of modern business, building a strong brand is no longer simply a decorative endeavor; it is a strategic imperative. Brands serve as crucial differentiators, shaping consumer perceptions, influencing purchase decisions, and ultimately driving market success (Zaman et al., 2025). A well-defined branding strategy outlines the deliberate and continuous efforts undertaken by an organization to establish a unique and enduring identity in the minds of its target audience. This intricate process encompasses elements such as brand positioning, messaging, visual identity, and customer experience, aiming to forge a lasting emotional connection with consumers (Rather et al., 2022). By fostering brand loyalty and advocacy, effective branding strategies not only solidify market share but also unlock long-term growth potential.

The academic discourse on branding strategies is multifaceted and ever-evolving. Scholars delve into the theoretical underpinnings of brand management, explore the impact of cultural and technological shifts on brand development, and analyze the effectiveness of various branding practices across diverse industries (Swaminathan et al., 2020). This constant exploration and refinement of branding knowledge equip practitioners with the insights and tools necessary to navigate the intricate dance of crafting and sustaining brands that resonate deeply with their target audiences.

Understanding the intricacies of branding strategies is particularly crucial in today's hyper-competitive global marketplace. With consumers bombarded by countless marketing messages, brands must find ways to cut through the noise and establish a distinct presence. By diligently cultivating a brand image that aligns with their core values and

resonates with their target audience's aspirations, organizations can differentiate themselves from the competition and secure a coveted position in the hearts and minds of consumers (García-Salirrosas et al., 2024).

Within the dynamic ecosystem of commerce, sales volume occupies a central position as a key metric of a company's performance and growth. It represents the total quantity of goods or services sold over a specific period, reflecting the effectiveness of marketing, distribution, and product-market fit. Analyzing sales volume trends provides valuable insights into consumer behavior, market demand, and the overall health of a business. Companies leverage these insights to refine their strategies, allocate resources effectively, and ultimately improve their competitive edge (Wang & Aviles, 2023).

Factors influencing sales volume are numerous and multifaceted. They encompass internal elements such as product quality, pricing strategy, and operational efficiency, as well as external factors like market competition, economic trends, and consumer preferences (Ibrahim & Harrison, 2019). Unraveling the complex interplay of these factors demands a holistic approach that delves into marketing, economics, psychology, and other relevant disciplines. Understanding the dynamics that drive sales volume empowers businesses to develop informed strategies, optimize their operations, and ultimately achieve sustainable growth.

Brand awareness stands as the first hurdle. Many Nigerian manufacturers grapple with limited marketing budgets and inadequate understanding of their target audience. Traditional marketing channels, while familiar, often fail to reach a wider consumer base, particularly the burgeoning youth market (Nesterenko et al., 2023). The digital landscape, though brimming with potential, remains largely untapped, with manufacturers struggling to leverage social media and online platforms effectively (Dwivedi et al., 2021). As a result, brand names struggle to resonate with consumers, leading to missed opportunities and stagnant sales figures.

Brand loyalty presents another formidable challenge. In a market flooded with imported goods, often perceived as superior in quality, Nigerian manufacturers face an uphill battle in fostering customer loyalty. Inconsistent product quality, coupled with poor after-sales service, erodes trust and encourages consumers to switch brands readily (Ibrahim & Abubakar, 2023). The lack of differentiation in product offerings further exacerbates the problem, with many manufacturers failing to establish a unique selling proposition that compels customers to stay loyal (Kim et al., 2021). Consequently, sales volumes remain vulnerable to price fluctuations and competitor marketing blitzes.

So specifically the objectives of the study include: to determine the effect of brand awareness on customer patronage and to examine the influence of brand loyalty on purchase decision in Nestle products.

2. LITERATURE REVIEW

2.1. Conceptual Review

2.1.1. Concept of Branding

Branding is one of the most important components of marketing. Branding is a term used to describe the name, description and design of a product (Klink, 2003). Zaichkowsky (2010) sees branding as the use of a name, term, symbol or design or a combination of these to identify a product, In addition, it is the use of a distinctive name and mark on a product to differentiate it from similar competitive products. Guliyev (2016) notes that branding refers to the fundamental differentiation devise for all products; it includes, name, words, symbols, or designs that identify the product and its source and distinguishes it from competing products.

Customers attach meanings to brands and this helps them to develop brand relationships. According to Dinu (2025) Brand is a name, term, symbol, design or a combination of these to identify a product. It includes the use of brand name, brand mark and trade mark. The brand identifies the product for the consumer and relates it to brand and product design. Brand identifies the seller or maker. Under the trademark law, the seller is granted the exclusive rights to use the brand name in perpetuity. Brands differ from other assets such as patents and copyrights which have expiry dates.

2.1.2. Sales Volume

The term sales include all activities involved in selling a product or service to a consumer or business. But for businesses sales means much more than that. There are entire sales organizations made up of employees that are dedicated to selling the products and services of companies. The activities that lead to the selling of goods or services are described as sales. For some businesses, they have sales organizations that are differentiated into various teams. These sales teams are often determined based on the region they are selling to, the product or service they're selling, and the target customer (Vendrell-Herrero et al., 2021).

When a transaction between two or more parties takes place in which the buyer receives tangible or intangible goods, services, and/or assets in exchange for money, a sale is said to have occurred. In some cases, sellers are paid other assets. A sale in the financial markets will refer to an agreement made between a buyer and seller regarding the price of a security. A transaction is not considered to be a sale, but rather a gift or a donation if the item or service in question is transferred

by one party to the other with no compensation. A transaction must involve the exchanging of goods, services, or payments between a buyer and a seller to be formally considered a sale (Badrinarayanan & Ramachandran, 2024).

2.1.3. Effect of Brand Strategies on Sales Volume

Branding strategies significantly influence consumer behavior and sales volume by fostering emotional connections and loyalty. Consistent communication of brand values and unique selling propositions (USPs) drives higher sales growth, as consumers trust cohesive brand identities. Emotional appeals and storytelling in branding, as noted by Dave et al. (2025), further enhance sales by resonating deeply with target audiences. Digital branding strategies, such as social media campaigns, also amplify sales by increasing visibility and engagement (Kumar, 2024).

Conversely, ineffective branding strategies can hinder sales growth and market share. Brands that fail to differentiate themselves often struggle to capture consumer attention, leading to lower sales (Gupta et al., 2020). Aat and Sjoraida (2025) found that weak brand positioning results in consumer apathy, directly impacting sales performance. Additionally, inconsistent messaging or poor brand alignment with consumer values can erode trust and reduce purchase intent (Ozdemir et al., 2020). Therefore, brands must adopt clear, differentiated strategies to avoid diminishing sales and maintain competitive advantage.

2.2. Hypotheses Development

2.2.1. Brand awareness and customer patronage

Brand awareness plays a foundational role in shaping consumer behavior, acting as the initial trigger for brand recognition and eventual loyalty. When consumers are familiar with a brand, they are more likely to consider it in their purchase decisions, increasing the likelihood of patronage. Empirical evidence supports this relationship; for example, a study on alcoholic beverages in Nigeria found that brand awareness had a significant and positive impact on customer patronage, suggesting that higher awareness leads to increased consumer engagement and loyalty (Sunday & Olasoji, 2023). Similarly, another study in Akwa Ibom State revealed that brand awareness strongly influences customer patronage, emphasizing the importance of visibility and image-building in competitive markets (Ekong et al., 2023). These findings underscore the importance for businesses to invest in awareness campaigns to attract and retain customers. Hence, the development of hypothesis one:

H1: brand awareness has significant influence on customers' patronage

2.2.2. Brand loyalty and purchase decision

Brand loyalty significantly shapes consumer purchase decisions by reducing perceived risk, reinforcing positive associations, and simplifying decision-making processes. Loyal customers tend to develop an emotional bond and trust toward a brand, which increases the likelihood of repeat purchases. For instance, research in the automotive industry confirms a strong positive relationship between brand loyalty and purchase decisions, highlighting loyalty as a critical determinant of consumer preference (Nyong et al., 2023). Similarly, a study on cosmetic purchases through online platforms found that higher brand loyalty significantly increases purchase intention and actual buying behavior (Lang et al., 2022). Additionally, broader research confirms that brand loyalty positively affects purchase decisions across various sectors, including airlines and FMCG products (Nyong et al., 2023). These studies collectively affirm that cultivating brand loyalty is a strategic approach to influencing consistent consumer purchasing behavior. Hence, the formulation of hypothesis two:

H2: brand loyalty has no significant influence on purchase decision

2.3. Theoretical Review

2.3.1. Brand Relationship Theory

The brand relationship paradigm is shaped by two key catalysts: Blackston (1992) introduced the idea that brands are active partners in relationships, emphasizing the need to consider not only consumers' perceptions of brands but also their beliefs about how brands perceive them, while Fournier (1998) expanded this concept, proposing a framework for consumer-brand relationships that positioned brands as active participants. Gummesson (2017) further advanced this theory, highlighting that brand relationships are personalized, as consumers define them based on individual perspectives, brand value, and experiences, a notion supported by Lindberg and Vermeer (2019), who noted that customers create personalized brand meanings through interactions across contexts. However, this typology primarily focuses on positive

relationships, potentially overlooking negative or neutral dynamics, as highlighted by Aaker and Biel (2016), whose longitudinal study revealed that brand personality and experiences of transgression significantly influence relationship development and evolution.

2.4. Empirical Review

A review by Gan et al. (2025) conducted a quantitative study titled "The Key Success Factors in Marketing Strategy: A Case Study of a Global Food and Beverage Company" to examine how Nestlé's marketing strategies—specifically quality perception, distribution intensity, and advertising—affect brand equity. Using a questionnaire distributed to 200 randomly selected consumers, the study found that brand awareness significantly mediates the relationship between marketing factors and brand equity. Quality perception, distribution intensity, and advertising all positively influenced both brand awareness and brand equity, which in turn are crucial for sales performance. The authors concluded that effective marketing strategies are essential for strengthening brand equity and, by extension, sales volume.

One such study by Chang et al. (2023) explored the impact of the 4Ps (product, price, place, promotion) on customer satisfaction in their study "Marketing Strategies in Delivering Customer Satisfaction: A Case Study of Nestlé." The researchers surveyed 160 Nestlé users and applied multiple linear regression to test the relationship between marketing strategies and customer satisfaction. The findings revealed that all elements of the marketing mix were significantly related to customer satisfaction, with promotion strategies (such as sales promotions and discounts) showing a particularly strong effect. The study concluded that comprehensive marketing strategies not only enhance customer satisfaction but also contribute to increased sales and brand reputation.

Bakare and Rahim (2023) investigated the role of niche marketing in sales performance in their study "Niche Marketing and Operational Performance in the Nigerian Manufacturing Industry: A Study of Nestle Nigeria Plc. Lagos." Employing a cross-sectional survey of 125 marketing staff, the study used regression analysis to assess the impact of niche marketing on sales. The results indicated that niche marketing significantly improves customer patronage and sales performance. The authors concluded that adopting niche strategies is a potent approach for boosting sales and achieving sustainable growth in competitive markets

3. METHDOLOGY

The research employed a descriptive design and employ the survey methodology. This is due to the fact that the goal of descriptive research is to accurately depict a person, event, or circumstance. Since it contributes to the explanation of present practices related to the topic issue, descriptive research design is deemed suitable to examine the effect of branding strategies on sales volume of nestle products in university of Ilorin, Kwara State. The students of management science faculty which are 2375 as at 2023/2024 session and were considered for this study as the research population. The survey's respondents were chosen from the whole population of the study region using the simple random sampling approach since almost all the citizen of Nigeria are familiar with Nestle products and mostly go for it as their food and beverages and consume it. The sample size was calculated using Yamane's 1967 formula, 342 students who are Nestle product users are therefore considered as the actual respondents for this study. A structured questionnaire was used to gather replies from the respondents which served as the primary source of data. The questionnaire had four major sections. The first one covered three structure items on brand awareness, second section had three items on customer patronage, third section covered two structured items on brand loyalty, while the fourth section covered three structure items on purchase decision. Five-point Likert scale was adopted as the scale of measurement for the questionnaire. The instrument was validated through face and content validity which was done by some lecturers and professors in the field of business administration and management while the reliability of the study was assess through Cronbach alpha with 0.7 benchmark. The data collected was analyzed quantitatively using inferential statistics in the form of multiple linear regression done through statistical product and service solution (SPSSS v 27). The study performed a regression analysis to establish the association between the independent variables and the dependent variable.

3.1. Model Specification

3.1.1. Model 1

$H0_1$: Brand awareness does not have significant effect on customer patronage.

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_{3+} + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots (1)$$

Where:

Y	= Customer Patronage (CP)	X_3	= Distribution Channels (DC)
X_1	= Advertising Exposure (AE)	e	= Error Terms
X_2	= Word of Mouth (WM)		

3.1.2. Model 2

$H0_2$: Brand loyalty does not significantly influence purchase decision.

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_{3+} + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots (1)$$

Where:

Y = Purchase Decision (PD)
X_1 = Repeat Purchases (RP)
X_2 = Brand Trust (BT)
X_3 = Emotional Attachment (EA)
e = Error Terms

3.1.3. Results

Table 1

Reliability Result

Scale	Number of Items	Cronbach's Alpha	Interpretation
Brand Awareness	3	0.847	Excellent
Customer Patronage	3	0.823	Very Good
Brand Loyalty	2	0.789	Acceptable
Purchase Decision	3	0.865	Excellent

Source: SPSS Output, 2025

Table 1 shows that all scales demonstrate acceptable to excellent internal consistency reliability with Cronbach's alpha values ranging from .789 to .865, exceeding the minimum threshold of .70, indicating that the measurement instruments are reliable for data collection.

3.2. Test of Hypotheses

Hypothesis one: Brand awareness has no significant impact on customer patronage.

Table 2 shows that no multicollinearity issues detected as all VIF values are below 5.0 and tolerance values exceed 0.2, while condition indices are below 15, indicating that predictor variables are not highly correlated with each other.

Table 2

Multicollinearity Diagnostics

Variable	Tolerance	VIF	Condition Index
Word of Mouth	0.743	1.346	1.000
Distribution Channels	0.681	1.468	2.134
Advertising Exposure	0.798	1.253	2.756

Note: Eigenvalues are 3.421, 0.382, 0.197
Source: SPSS Output, 2025

Table 3 presents model summary which shows that the correlation coefficient which is R is 0.769 which indicate that there is a strong positive relationship between customer patronage (Dependent Variable) and brand awareness (Independent Variable) which are being predicted by advertising exposure, word of mouth, and distribution channels. Also, it is seen from the table that the coefficient of Determination which is R^2 is 59.1%. This implies that customer patronage can be explained by Advertising exposure, Word of mouth and distribution channels. The remaining percentage which is 40.9% is explained by other factors which are not explained in the model. Therefore, the implication is that brand awareness has significant impact on customer patronage.

Table 3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	.591	.587	.10375

a. Predictors: (Constant), Advertising exposure, Word of mouth, Distribution channels

Source: SPSS Output, 2025

Table 4

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	436.601	3	145.534	13083.152	.000[b]
	Residual	3.081	277	.011		
	Total	439.682	280			

a. Dependent Variable: Customer patronage

b. Predictors: (Constant), Advertising exposure, Word of mouth, Distribution channels

Source: SPSS Output, 2025

The F-statistics as shown from the ANOVA in Table 4 is significant since the ANOVA significance of .000 is less than the alpha level of .05, thus the result is achieved. Also, the regression sum of square of 436.601 is greater than residual sum of square of 3.081, which further show the significance and fitness of the overall model. Therefore, the proxies which are Advertising exposure, Word of mouth, as well as Distribution channels are major determinant affecting Customer patronage.

Table 5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.071	.022		3.227	.000
	Word of mouth	.403	.018	.399	22.388	.000
	Distribution channels	.152	.028	.148	5.428	.000
	Advertising exposure	.064	.009	.058	7.005	.000

a. Dependent Variable: Customer patronage

Source: SPSS Output, 2025

Table 5 shows the coefficient of individual independent variable which indicated that word of mouth (.403) has a fair effect as a proxy of brand awareness on customer patronage. In addition, the (probability) and t-statistics value of (.000) and 22.388 further suggest that the relationship between word of mouth and customer patronage is significant since alpha level of 0.05 is greater than the p-value of 0.000. The findings therefore, is that word of mouth has influence on customer patronage.

The coefficient of individual independent variable indicated that distribution channels (.152) and advertising exposure (.064) both have fair effect respectively as proxies of brand awareness on customer patronage. In addition, the (probability) and t-statistics value of distribution channels (.000) and 5.428 as well as advertising exposure (.000) and 7.005 further suggest that the relationship between distribution channels, advertising exposure and customer patronage is significant since alpha level of 0.05 is greater than the p-values of 0.000 and 0.000. The findings therefore, is that distribution channels and advertising exposure have influence on Customer patronage.

Therefore, since R^2 of 59.1% is positive and the ANOVA significance of .000 is less than p-value of .05, therefore, the null hypothesis which state that "brand awareness has no significant impact on customer patronage." is not accepted and the alternate hypothesis when stated is accepted.

Hypothesis two: Brand loyalty has no significant influence on purchase decision

Table 6

Multicollinearity Diagnostics

Variable	Tolerance	VIF	Condition Index
Emotional Attachment	0.823	1.215	1.000
Brand Trust	0.823	1.215	1.892

Note: Eigenvalues are 2.567, 0.433
Source: SPSS Output, 2025

Table 6 shows that multicollinearity is not a concern in this model as both VIF values are well below 5.0, tolerance values are above 0.2, and condition indices are acceptable, confirming that emotional attachment and brand trust are distinct predictors.

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837[a]	.701	.698	.13532

a. **Predictors:** (Constant), Brand trust, Emotional attachment
Source: SPSS Output, 2025

Table 7 presents model summary which shows that the correlation coefficient which is R is 0.837 which indicate that there is a strong positive relationship between purchase decision (dependent variable) and brand loyalty (independent variable) which are being predicted by brand trust and emotional attachment. Also, it is seen from the table that the coefficient of determination which is R^2 is 70.1%. This implies that purchase decision can be explained by emotional attachment and brand trust. The remaining percentage which is 29.9% is explained by other factors which are not explained in the model. Therefore, the implication is that brand loyalty has significant influence on purchase decision.

Table 8

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	451.206	2	225.603	9289.594	.000[b]
	Residual	6.751	278	.024		
	Total	457.957	280			

a. Dependent Variable: Purchase decision
b. Predictors: (Constant), Brand trust, Emotional attachment
Source: SPSS Output, 2025

The F-statistics as shown from the ANOVA in Table 8 is significant since the ANOVA significance of .000 is less than the alpha level of .05, thus the result is achieved. Also, the regression sum of square of 451.206 is greater than residual sum of square of 6.751, which further show the significance and fitness of the overall model. Therefore, the proxies which are brand trust and emotional attachment are major determinant of factors affecting purchase decision.

Table 9 shows that the coefficient of individual independent variable indicated that emotional attachment (.539) and brand trust (.184) both have fair effect respectively as proxies of brand loyalty on purchase decision. In addition, the (probability) and t-statistics value of emotional attachment (.000) and 19.963 as well as brand trust (.000) and 8.762 further suggest that the relationship between emotional attachment, brand trust and purchase decision is significant since alpha level of 0.05 is greater than the p-values of 0.000 and 0.000. The conclusion therefore is that emotional attachment and brand trust have influence on purchase decision.

Therefore, since R^2 of 70.1% is positive and the ANOVA significance of .000 is less than p-value of .05, therefore, the null hypothesis which states that "brand loyalty has no significant influence on purchase decision" is not accepted and the alternate hypothesis when stated is accepted.

Table 9

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.082	.023		3.565	.003
	Emotional attachment	.539	.027	.535	19.963	.000
	Brand trust	.184	.021	.179	8.762	.000

a. Dependent Variable: Purchase decision

Source: SPSS Output, 2025

Table 10

Model Diagnostics Summary

Model	Normality Test (K-S)	Homoscedasticity (Levene's)	Linearity (Rainbow Test)	Overall Assessment
Model 1	p = .142	p = .089	p = .156	Assumptions Met
Model 2	p = .187	p = .123	p = .201	Assumptions Met

Source: SPSS Output, 2025

Table 10 shows that both regression models satisfy all key assumptions including normality, homoscedasticity, and linearity with no significant outliers or influential cases detected, confirming the robustness and validity of the statistical analyses conducted.

4. Discussion of Research Findings

The analysis of the first objective revealed that brand awareness components, specifically attitude and cooperation, distribution channels, and advertising exposure, demonstrate substantial impact on customer patronage patterns. The empirical evidence suggests that brand awareness operates as a multidimensional construct where each element synergistically contributes to consumer engagement. From the statistical findings, it was observed that brand awareness functions as a primary determinant influencing the rate and consistency of customer patronage, with the regression model explaining 59.1% of the variance in customer patronage. This high explanatory power indicates that brand awareness is not merely a peripheral marketing factor but rather a fundamental driver of consumer behavior among student customers of Nestle products in the Nigerian university context. The remaining 40.9% attributed to unexplained factors suggests external influences, highlighting the robustness of brand awareness as a predictor. This result substantiates and extends the empirical findings of Gan et al. (2025), Bakare and Rahim (2023) and Chang et al. (2023), while also suggesting that in educational institutional markets, brand awareness may have even stronger predictive validity than in general consumer markets. The theoretical implication is that brand awareness transcends simple recognition to encompass deep cognitive and behavioral engagement mechanisms that directly translate into measurable patronage outcomes.

The analysis of the second objective demonstrates a statistically significant and practically meaningful relationship between brand loyalty dimensions and purchase decision-making processes. The p-values of all proxies registering 0.000, substantially below the conventional alpha level of 0.05, provide compelling evidence that emotional attachment and brand trust, as core manifestations of brand loyalty, serve as critical determinants of purchase decision outcomes. This

statistical significance, combined with an R^2 value of 70.1%, reveals that brand loyalty explains high variance in purchase decisions, suggesting that loyal customers exhibit highly predictable purchasing patterns. The emotional attachment component indicates that consumers develop psychological bonds with brands that transcend rational evaluation, while brand trust reflects confidence in consistent quality and reliability. These findings align with and reinforce the theoretical framework established by Gan et al. (2025), Bakare and Rahim (2023) and Chang et al. (2023), while extending their work by demonstrating the strong predictive power of brand loyalty in the Nigerian educational market context. This practically means that brand loyalty operates as both an emotional and cognitive filter that significantly reduces decision complexity for consumers, leading to more automatic and consistent purchase behaviors.

4.1. Policy and Practical Implications

The findings of this study carry profound practical implications for multinational corporations, local businesses, and marketing practitioners operating within institutional markets across Nigeria and similar emerging economies. For Nestle and comparable FMCG companies, the results demonstrate that allocating substantial resources toward comprehensive brand awareness campaigns, encompassing strategic advertising placement, optimized distribution channel management, and targeted attitude-shaping initiatives, generates measurable returns with near-certainty, effectively transforming marketing expenditure from cost centers into revenue-generating investments with predictable outcomes. Marketing managers should prioritize integrated branding strategies that simultaneously build cognitive recognition through consistent advertising exposure while fostering emotional attachment and trust through quality consistency, customer service excellence, and authentic brand storytelling that resonates with the specific cultural and demographic characteristics of its customers especially the students of university communities as in this case. The exceptionally high explanatory power of both brand awareness (59.1%) and brand loyalty (70.1%) suggests that companies can confidently invest in long-term branding initiatives, knowing that these investments will translate directly into customer acquisition and retention with minimal uncertainty. Nestle's dominance in Nigerian universities demonstrates that investing in brand awareness and loyalty isn't just marketing expense, it's the strategic imperative that converts above 59% of branding efforts directly into sales revenue, proving that comprehensive brand strategy is the ultimate competitive differentiator in institutional markets. Furthermore, the findings indicate that businesses operating in institutional markets should develop specialized branding approaches that leverage the unique characteristics of educational environments, such as peer influence, extended decision-making periods, and brand experimentation behaviors, to create sustained competitive advantages. For smaller competitors seeking to challenge established brands like Nestle, the results suggest that success requires simultaneous, substantial investment in both awareness-building and loyalty-cultivation activities rather than piecemeal approaches, as the strength of these relationships creates significant barriers to entry that can only be overcome through comprehensive, well-resourced branding strategies that consistently deliver superior value propositions across all touchpoints.

5. Conclusion

The study provides compelling empirical evidence for the pivotal role of brand awareness in driving customer patronage within Nigerian university markets. The finding that variance in a large part of customer patronage can be attributed to brand awareness factors represents a paradigm shift in understanding consumer behavior in institutional settings. This explanatory power suggests that brand awareness operates through multiple reinforcing mechanisms, cognitive recognition, emotional resonance, and behavioral conditioning that collectively create an almost deterministic relationship with patronage decisions. The finding emphasizes that effective communication strategies and strategic brand visibility initiatives are not merely supportive marketing activities but rather fundamental business imperatives that directly drive revenue generation. Furthermore, the strength of this relationship indicates that in competitive university markets, brand awareness may serve as a sustainable competitive advantage that is difficult for competitors to replicate.

The research simultaneously demonstrates an equally robust relationship between brand loyalty and purchase decisions, with the statistical model explaining large part of purchase decision variance. The identification of emotional attachment and brand trust as primary mediating factors reveals that successful brands create psychological ecosystems where consumers develop deep, multifaceted relationships that extend beyond transactional exchanges. These insights suggest that companies operating in educational markets must strategically invest in loyalty-building initiatives that foster both emotional connections and trust-based relationships. The convergence of both brand awareness and brand loyalty as near-perfect predictors of consumer behavior indicates that Nestle's success in Nigerian universities stems from a comprehensive branding strategy that simultaneously builds recognition and cultivates deep customer relationships. This dual-pathway approach creates a self-reinforcing cycle where awareness drives initial engagement, loyalty sustains long-term relationships, and both factors collectively generate predictable, high-volume sales outcomes that justify substantial branding investments.

6. Recommendations

The following recommendations were made strictly from the findings of the study:

To enhance brand awareness, it is essential to invest in comprehensive marketing campaigns. These should include a mix of word-of-mouth strategies, social media outreach, and traditional advertising methods to effectively increase brand visibility. Additionally, leveraging distribution channels to make products more accessible can significantly boost brand recognition and encourage customer patronage.

Building brand loyalty requires a focused approach that nurtures customer relationships. Implementing loyalty programs that reward repeat customers can create a strong emotional attachment and foster trust in the brand. Engaging customers through platforms for feedback and interaction is also crucial, as it strengthens relationships and builds a loyal community around the brand.

7. Contribution of the Study

This study contributes new empirical knowledge by providing the first comprehensive examination of brand awareness and loyalty effects on consumer behavior within the Nigerian university context, specifically focusing on Nestlé products. While the theoretical framework builds upon established constructs, the findings reveal that brand awareness and brand loyalty demonstrate stronger predictive validity in educational institutional markets compared to general consumer markets, as evidenced by higher variance explanations than previous studies. The context-specific insights offer a foundation for understanding consumer behavior patterns in emerging African markets and provide a replicable methodological approach for similar investigations across different product categories and educational institutions in developing economies.

8. Limitations of the Study

The study's scope is limited to a single multinational brand (Nestlé) within Nigerian universities, which restricts the generalizability of findings to other brands, product categories, or consumer segments outside the educational context. The survey design prevents the establishment of causal relationships and temporal dynamics between brand constructs and consumer behavior. Additionally, the focus on one geographical region (Nigeria) and demographic group (university students) limits the applicability of results to broader consumer populations or other Sub-Saharan African markets. The study also did not account for cultural, socioeconomic, or competitive factors that may influence brand perceptions and purchase decisions in the Nigerian market context.

Acknowledgment

The authors would like to thank anonymous reviewers for their supportive comments and suggestions.

Author's contribution

Ebenezer Oluwadamilare Balogun: Created ideas and hypotheses for study 50%, conceived and designed the study 70%, collected the data 50%, performed the analysis 100%, wrote the paper 20%, logical explanation and presentation of findings 50%, overall: 60 %.

Opeyemi Emmanuel Babawale Created ideas and hypotheses for study 50%, conceived and designed the study 30%, collected the data 50%, performed the analysis 0%, wrote the paper 80%, logical explanation and presentation of findings 50%, overall: 40 %

Disclosure statement

No potential competing interest to declare by the authors.

Funding

The author received no direct funding for this research.

Data availability statement

Data available on request due to privacy, from the author: Ebenezer Oluwadamilare Balogun balobendar@gmail.com

REFERENCES

Aaker, D. A., Biel, A. L. (2016). *Brand equity and advertising: Advertising's role in building strong brands*. Psychology Press.

Aat Ruchiat Nugraha, & Diah Fatma Sjoraida. (2025). Brand positioning strategy and consumer knowledge: its impact on brand attitude and purchase decision. *International Journal of Management Science and Information Technology*, *5*(1), 67–75. https://doi.org/10.35870/ijmsit.v5i1.3707

Badrinarayanan, V. & Ramachandran, I. (2024). Relational exchanges in the sales domain: A review and research agenda through the lens of commitment-trust theory of relationship marketing. *Journal of Business Research*, *177*, 114644–114644. https://doi.org/10.1016/j.jbusres.2024.114644

Bakare, R. D., & Rahim, A. G. (2023). Niche marketing and operational performance in the Nigerian manufacturing industry: a study of Nestle Nigeria Plc. Lagos. *Unilag Journal of Business*, *9*(2), 1–15. https://doi.org/10.52968/11209006

Blackston, M. (1992). Observations: building brand equity by managing the brand's relationships. *Journal of advertising research*, *32*(3), 79-83. https://doi.org/10.1080/00218499.1992.12466835

Chang, P. L., Chang, Y. Y., Chinnappan, C. C. A., Chai, M. H., & Ladeuth, L. M. A. (2023). Marketing strategies in delivering customer satisfaction: a case study of Nestlé. *International Journal of Tourism and Hospitality in Asia Pasific (IJTHAP)*, *6*(2), 26–39. https://doi.org/10.32535/ijthap.v6i2.2321

Dave, M., Makwana, R., Dua, K., & Srimali, K. (2025). Impact of storytelling and emotional branding on consumer purchase behavior in Quick Service Restaurants and FMCG. *International Journal of Innovative Science and Research Technology*, *10*(4), 1263–1277. https://doi.org/10.38124/ijisrt/25apr1346

Dinu, C. (2025). Trademark protection. *Bulletin of the Transilvania University of Braşov Series VII Social Sciences • Law*, 169–174. https://doi.org/10.31926/but.ssl.2024.17.66.3.19

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., & Carlson, J. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, *59*(1), 1–37. https://doi.org/10.1016/j.ijinfomgt.2020.102168

Fournier, S. (1998). Consumers and their brands: Developing relationship theory in consumer research. *Journal of consumer research*, *24*(4), 343-373. https://doi.org/10.1086/209515

Gan, K. H., Lim, H. L., Chung, W. N., Chow, L. Y., Chua, H. S., Dai, Z., Diong, W. T., Ali, A. J., & Kee, D. M. H. (2025). The key success factors in marketing strategy: A case study of a global food and beverage company. *Asian Pacific Journal of Management and Education*, *8*(1), 110–133. https://doi.org/10.32535/apjme.v8i1.3856

García-Salirrosas, E. E., Escobar-Farfán, M., Esponda-Perez, J. A., Millones-Liza, D. Y., Villar-Guevara, M., Haro-Zea, K. L., & Gallardo-Canales, R. (2024). The impact of perceived value on brand image and loyalty: a study of healthy food brands in emerging markets. *Frontiers in Nutrition*, *11*. https://doi.org/10.3389/fnut.2024.1482009

Guliyev, S. M. (2016). Consumer based brand equity. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2743079

Gummesson, E. (2017). From relationship marketing to total relationship marketing and beyond. *Journal of services marketing*, *31*(1), 16-19. https://doi.org/10.1108/JSM-11-2016-0398

Gupta, S., Gallear, D., Rudd, J., & Foroudi, P. (2020). The Impact of brand value on brand competitiveness. *Journal of Business Research*, *112*(5), 210–222. Researchgate. https://doi.org/10.1016/j.jbusres.2020.02.033

Ibrahim, E. B., & Harrison, T. (2019). The impact of internal, external, and competitor factors on marketing strategy performance. *Journal of Strategic Marketing*, *28*(7), 1–20. https://doi.org/10.1080/0965254x.2019.1609571

Ibrahim, B. M., & Abubakar, A. (2023). The moderating effect of brand loyalty on service quality and customer satisfaction in the telecommunications industry in northwest Nigeria. *Journal of Accounting, Business and Finance Research*, *17*(2), 78–86. https://doi.org/10.55217/102.v17i2.721

Ekong J. E., Mfon A. A., & Ibok N. I. (2023). innovative marketing skills and business performance of small and medium scale enterprises (SMEs) in Akwa Ibom State, Nigeria. *International Journal of Business and Management Review*, *11*(3), 48–64. https://doi.org/10.37745/ijbmr.2013/vol11n34864

Kim, E., Nicolau, J. L., & Tang, L. (Rebecca). (2021). The impact of restaurant innovativeness on consumer loyalty: The mediating role of perceived quality. *Journal of Hospitality & Tourism Research*, *45*(8), 109634802098558. https://doi.org/10.1177/1096348020985586

Klink, R. R. (2003). Creating Meaningful Brands: The relationship between brand name and brand mark. *Marketing Letters*, *14*(3), 143–157. https://doi.org/10.1023/a:1027476132607

Kumar, S.. (2024). Digital Marketing Strategies and their Impact on Consumer Behavior. *International Journal for Multidimensional Research Perspectives*, *2*(9), 27–44. https://doi.org/10.61877/ijmrp.v2i9.179

Lang, L. D., Behl, A., Guzmán, F., Pereira, V., & Del Giudice, M. (2022). The role of advertising, distribution intensity and store image in achieving global brand loyalty in an emerging market. *International Marketing Review*, *40*(1). https://doi.org/10.1108/imr-06-2021-0200

Lindberg, D. F., & Vermeer, T. (2019). The never-ending story: discovering touch points and customer experiences along the customer journey.

Nesterenko, V., Miskiewicz, R., & Abazov, R. (2023). Marketing communications in the era of digital transformation. *Virtual Economics*, *6*(1), 57–70. https://doi.org/10.34021/ve.2023.06.01(4)

Nyong, T.-A., Umoren, P., Akarika, D., & Bassey, B. (2023). Influence of advertising on brand patronage of Macleans Toothpaste in Akwa Ibom State, Nigeria. *AKSU Journal of Social Sciences*, *3*(2), 1–14. https://doi.org/10.61090/aksujoss.2023.010

Ozdemir, S., Zhang, S., Gupta, S., & Bebek, G. (2020). The effects of trust and peer influence on corporate brand—consumer relationships and consumer loyalty. *Journal of Business Research*, *117*, 791–805. https://doi.org/10.1016/j.jbusres.2020.02.027

Rather, R. A., Hollebeek, L. D., VO-THANH, T., Ramkissoon, H., Leppiman, A., & Smith, D. (2022). Shaping customer brand loyalty during the pandemic: The role of brand credibility, value congruence, experience, identification, and engagement. *Journal of Consumer Behaviour*, *21*(5). https://doi.org/10.1002/cb.2070

Sunday, A. O., & Olasoji, O. T. (2023). The impact of brand awareness on customer loyalty in selected food and beverage businesses in Lagos State Nigeria. *Jurnal Multidisiplin Madani*, *3*(3), 541–551. https://doi.org/10.55927/mudima.v3i3.3095

Swaminathan, V., Sorescu, A., Steenkamp, J.-B. E. M., O'Guinn, T. C. G., & Schmitt, B. (2020). Branding in a hyperconnected world: refocusing theories and rethinking boundaries. *Journal of Marketing*, *84*(2), 24–46. Sagepub. https://doi.org/10.1177/0022242919899905

Vendrell-Herrero, F., Bustinza, O. F., & Opazo-Basaez, M. (2021). Information technologies and product-service innovation: The moderating role of service R&D team structure. *Journal of Business Research*, *128*, 673–687. https://doi.org/10.1016/j.jbusres.2020.01.047

Wang, F., & Aviles, J. (2023). Enhancing operational efficiency: integrating machine learning predictive capabilities in business intellgence for informed decision-making. *Frontiers in Business, Economics and Management*, *9*(1), 282–286. https://doi.org/10.54097/fbem.v9i1.8694

Zaichkowsky, J. L. (2010). Strategies for distinctive brands. *Journal of Brand Management*, *17*(8), 548–560. https://doi.org/10.1057/bm.2010.12

Zaman, S. U., Arif, A., & Alam, S. H. (2025). Examining the influence of marketing communication and brand identity on consumer decisions. *Journal of Political Stability Archive.*, *3*(2), 75–99. https://doi.org/10.63468/jpsa.3.2.05

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THEORY METHODOLOGY PRACTICE | Review of Business and Management
2025 VOLUME 21 NUMBER 2
https://doi.org/10.18096/TMP.2025.02.03

What are hypermarkets and discount chains doing for sustainability?

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SUMMARY

The aim of this study is to highlight the contribution of hypermarkets and discount chains to sustainability in Hungary. Within the framework of the article, we examine to what extent the United Nations' 17 Sustainable Development Goals (SDGs) are reflected in the objectives of the different chains. An important part of our analysis is the conceptual approach to sustainability and its presentation. When addressing this issue, the specific role of various actors in the food trade, their presence in the market space, as well as the measures taken to reduce waste, ensure safety, and minimize losses cannot be ignored. Artificial Intelligence and COVID-19 have brought significant changes to the food retail sector, as a result of which food trade is shifting considerably towards online or so-called "mute" trade. Consequently, online sales, automation and robotization processes, as well as sustainability, social innovation, and personalization in sales will gain more importance in the future.

HOW TO CITE:

Sikos T., T., & Nagy, L. (2025). What are hypermarkets and discount chains doing for sustainability? *THEORY METHODOLOGY PRACTICE: Review of Business and Management, 21*(2), 34-43. https://doi.org/10.18096/TMP.2025.02.03

ARTICLE HISTORY
Received 30 September 2025
Revised 30 November 2025
Accepted 04 December 2025
Published 09 December 2025

KEYWORDS
Food trade, hypermarkets and discount chains, SDG, sustainability, social innovation

JEL CLASSIFICATION
L81, R12, Y10, Q01

1. INTRODUCTION

One of the central issues today is the concept of sustainability and its interpretation. Sustainability now appears in politics, in the business world, and even in everyday professional and non-professional discussions. This is no coincidence: over the past decades, it has become increasingly clear that in the long term we will only be successful if we harmonize environmental, economic, and social considerations. However, how this should be done is far from obvious. Different disciplines approach it from different angles: there are definitions emphasizing economic, ecological, or social aspects.

In this overview, we examine how the concept of sustainability has developed in the field of commerce from its beginnings to the present day, which international frameworks have shaped it, and what particularities can be observed within Hungarian academic literature. The first comprehensive formulation of the idea of sustainability is linked to the 1972 report of the Club of Rome, The Limits to Growth (Meadows et al., 1972). The analysis warned that continuous growth in population, industrialization, and consumption could lead to collapse in the long run due to the planet's finite resources. This approach was clearly environment-centered, focusing on ecological limits while considering social and economic factors secondary. Although the report was strongly debated, it fundamentally contributed to the emergence of the concept of sustainable development in international political and scientific discourse. The most well-known and most frequently cited definition of sustainable development comes from the 1987 report of the United Nations World Commission on Environment and Development (WCED), "Our Common Future" (the Brundtland Report), which defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). The core element of this definition is the concept of needs, with special attention to the basic needs of the world's poor, as well as the idea that technology and social organization impose limits on exploiting the environment's carrying capacity. In 2015, world leaders adopted at the UN Sustainable

Development Summit under the title: "Transforming Our World: The 2030 Agenda for Sustainable Development". The UN's Sustainable Development Goals (SDGs), adopted in 2015, encompass 17 goals and 169 targets, serving as a compass for governments, businesses, and civil organizations, supplemented by measurable indicators (Veresné Somosi & Sikos T., 2023). The SDGs are based on the triple-pillar model of sustainability (economic, social, and environmental dimensions). At the same time, they have faced criticism, as some goals may contradict one another for example, the tension between promoting economic growth and adhering to ecological limits (Easterly, 2015). For the corporate sector, the ESG (Environmental, Social, Governance) framework provides an important guideline, making sustainability measurable from an investment and financial perspective. While ESG contributes to the interpretation of sustainability in business terms, critics argue that it often leads to formalism and greenwashing (Kotsantonis et al., 2016). In the following, we review the role and commitments of hypermarkets and discount chains in sustainability.

Among international studies addressing this topic, the UNCTAD (United Nations Conference on Trade and Development) report The Future of Sustainable Trade, published in 2024, is of particular significance. The report highlights three major thematic areas:

1. **Regulatory transformation**, closely aligned with the targets formulated by the United Nations in 2015, including decent working conditions (SDG 8), action against climate change (SDG 13), the sustainable use and conservation of oceans, seas, and marine resources (SDG 14), and the protection of terrestrial ecosystems (SDG 15) (Berning & Sotirov, 2023; Marx et al., 2021, 2024).

2. **Challenges for developing countries**, which primarily concern making global trade more ethical by ensuring fair access for developing economies to international markets—thus facilitating responsible consumption and enabling production to reach markets under equitable conditions (SDG 12) (Bemelmans et al., 2023; Elamin & Fernandez de Cordoba, 2020; Fiankor et al., 2020; Andersson, 2019).

3. **Voluntary sustainability standards (VSS)** for policymakers and businesses (Bennett, 2017).

In the following section, considering the above perspectives, we examine how hypermarket and discount retail chains engage with and contribute to sustainability within the retail sector.

2. The Role of the Hypermarkets and Discount Stores in Sustainability

Under the current political, economic, and environmental conditions, the implementation of the UN's 2030 Agenda for Sustainable Development is becoming increasingly important, in which food retail chains also play a significant role (Table 1).

Table 1

The contribution of domestic hypermarket and discount chains to the achievement of individual SDG goals

SDG aims	*Tesco*	*Spar*	*Auchan*	*Lidl*	*Aldi*	*Penny Market*
No Poverty, SDG1			X	X		
Zero Hunger, SDG2	X	X	X	X		X
Good Health and Well-Being, SDG3	X	X	X	X	X	
Quality Education, SDG4				X		
Gender Equality, SDG5	X	X	X	X	X	X
Clean Water and Sanitation, SDG6				X	X	X
Affordable and Clean Energy, SDG7	X	X	X	X	X	X
Decent Work and Economic Growth, SDG8	X	X	X	X	X	X

Industry, Innovation and Infrastructure, SDG9						
Reduced Inequalities, SDG10	X					
Sustainable Cities and Communities, SDG11	X	X				
Responsible Consuption and Production, SDG12	X	X	X	X	X	X
Climate Action, SDG13	X			X	X	X
Life Below Water, SDG14	X		X			
Life on Land, SDG15	X		X	X	X	X
Peace, Justice and Strong Institutions, SDG16						
Partnerships for the Golas, SDG17			X			

Source: Table 1 was compiled using secondary qualitative content analyses, the sustainability annual reports of the six retail chains, as well as professional articles and press materials from civil society organizations; own research.

There are hardly any significant differences between hypermarkets and discount stores in terms of the UN Agenda 2030 goals. Nevertheless, Tesco and Lidl have the broadest spectrum of contributions among them (Sikos T. & Szendi, 2024).

Tesco entered the Hungarian market in 1994, when it acquired the Globál store network. Today, it operates more than 200 retail units. The company opened its first supermarket in Szombathely, followed by its then most significant store opening in 1996 at the Pólus Center, covering 2,500 m². Currently, 52% of Tesco's store network consists of hypermarkets (109 stores), with its largest business units now reaching a floor area of 15,000 m² (Sikos T., 2019). The key to Tesco's international and domestic success lies in its innovative business approach: it has always strived to apply the most modern methods and tools in developing its retail network and business units. To this end, the company continuously monitors changes in consumer behavior and seeks to adapt to market demands. Its stable operation is also supported by the fact that its business philosophy has hardly changed since its foundation. Today, its portfolio remains diversified, focusing on clothing, food and beverages, as well as services.

In the domestic market, however, the company faces serious challenges from competitors, particularly discount chains. Lidl, as its biggest competitor, has been present in the Hungarian food retail market since 2004. Lidl is committed to both society and the environment. In its daily operations, it assumes economic, social, and ecological responsibility. It maintains open communication with its customers and employees and actively supports the circular economy, climate protection, and fair wages.

Part of Lidl's sustainability strategy is to "make high-quality food accessible to everyone," supporting through donations:

1. disadvantaged families and children,
2. healthier nutrition for children requiring hospital care,
3. and the care of animals living in shelters.

Its business policy also includes tackling food waste, which it partly achieves through precise inventory management in its stores. Within the framework of the circular economy, it aims to reduce plastic use in its stores by 20% by 2025. Affordable and Clean Energy (SDG 7) is of particular importance to both hypermarkets and discount stores, and Lidl is at the forefront in this area.

Today, Lidl's main competitors in the discount sector are Aldi (annual turnover per store in 2024: HUF 3.46 billion) and Penny Market (annual turnover per store in 2024: HUF 2.64 billion), although both are behind Lidl's figures (annual turnover per store in 2024: HUF 7.53 billion) (Trade Magazin, 2024a). Penny Market's philosophy is based on cooperation and supporting retailers, as this is a prerequisite for the viability and development of small businesses. Penny Market entered Hungary in 1996 and has since expanded its store network to 228 units. It supplies its stores from three logistics centres (Alsónémedi, Karcag, and Veszprém). The discount chain offers about 2,000 products in its stores, 40% of which are purchased from Hungarian producers, while domestic products account for around 50% of its private label range. Its private label products sourced from Hungarian suppliers often bear Hungarian names, such as *Karát*, *Dárdás*, and *Sissy*.

In terms of location, every fourth Aldi store, every fifth Lidl store, and every tenth Penny Market store operates in the capital. Penny Market's business strategy places a central focus on supplying rural areas. Its corporate social responsibility is similar to that of its competitors, with strong emphasis on supporting disadvantaged families and children. It gives

particular attention to assisting children undergoing hospital treatment, as shown by its support programs for paediatric oncology departments.

To protect health, Penny Market emphasizes the UN's *Clean Water and Sanitation* program (SDG 6) and takes steps toward a circular economy (bottle return, used battery collection, environmentally friendly shopping bags, etc.). Its efforts also extend to green energy (SDG 7).

Aldi likewise supports the UN Sustainable Development Goals, with particular focus on ensuring the sustainability of its private label products across the entire value chain and promoting responsible purchasing. Accordingly, Aldi has set out to contribute to the following SDGs: Responsible Consumption and Production (SDG 12), Climate Action (SDG 13), Decent Work and Economic Growth (SDG 8), and Life on Land (SDG 15), pursuing these goals even at store level.

Both hypermarket and discount chains use inventory management systems that minimize food stock losses, and any surplus that does occur is donated for charitable purposes.

3. Methodology

To compare sustainability strategies, we applied the radar method, which makes it possible to visually represent multidimensional performance. Our choice of this method is justified by its suitability for comparing multiple variables and its ability to provide a graphical representation of actors in the food market. The selected radar chart method makes outlier values visually prominent, thereby serving as an important comparative tool when examining several variables. In another field, Mosley and Mayer (1999) also applied this method to compare international labor market performance. During the analysis, three dimensions were defined: social responsibility, environmental sustainability, and economic success, which can be presented in the literature as the three pillars of sustainability (the triple bottom line) (Elkington, 1998). Performance values related to each dimension were assessed on a Likert scale ranging from 1 to 5, where 1 indicates weak and 5 indicates outstanding performance. The values were determined based on qualitative content analysis and the processing of secondary sources (corporate sustainability reports, professional publications, press sources), ensuring comparability across different companies.

The advantage of the radar method is that it can simultaneously display company profiles along the three dimensions, thus allowing for the quick identification of relative strengths and weaknesses. While the triangle model is primarily suited for presenting the balance between the three dimensions of sustainability, the radar method highlights the differences between companies more effectively and enables the simultaneous comparison of multiple actors using the same metrics. This is particularly advantageous when the goal is not merely theoretical positioning, but the systematic, quantifiable comparison of performance. At the same time, the method has limitations, as scaling is based on qualitative foundations; therefore, the radar method allows for relative rather than absolute comparison among the examined food retail chains (Kozma, 2019; Hahn et al., 2015).

We analysed the sustainability profiles of six food retail chains (Tesco, SPAR, Auchan, Lidl, ALDI, and Penny Market) using the radar chart method. The scoring method formed the basis of the database. The scores were the results of secondary qualitative content analyses, derived from the chains' sustainability and annual reports, professional articles, and materials published by NGOs. For each chain, we applied standardized scoring for each dimension. If there were multiple indicators within a dimension, we used the intersection approach: when a goal was defined but implementation was weak, it was assigned a middle value of three.

However, the method also has limitations. One such limitation arises from changes in the measures themselves, which make it necessary to update the radar chart values whenever new initiatives appear. Another limitation concerns the depth of reporting by the retail chains, which may distort comparisons, as not all companies disclose their sustainability-related data with the same level of detail.

The numerical scale used in the radar chart method is defined as follows:

Social responsibility dimension:

1 = ad hoc practices,
2 = minimal efforts,
3 = standardized programs,
4 = stable and long-term programs, although their impacts are not yet widely measurable (e.g., Lidl's domestic programs, which are not global),
5 = measurable and widespread impact.

Environmental sustainability dimension:

1 = minimal initiatives,
2 = basic actions with a narrow focus,
3 = defined targets and partial results,

4 = innovative solutions, though not yet widely implemented (e.g., several Lidl stores operate with rooftop solar panels, but not all),
5 = certified targets and wide-scale implementation.

Economic success dimension:
1 = limited results,
2 = stable but very slow growth,
3 = efficiency across multiple areas,
4 = significant revenue growth and high market share,
5 = measurable performance improvement and competitive advantage.

Assigning a score of 5 indicates advanced programs and measurable multi-year initiatives; however, it does not represent the absolute maximum because the objectives have only been partially achieved, or the impact is not fully demonstrated or transparent. These scores express the relative performance of the chains compared with one another (Table 2).

The scores assigned to each dimension are based on content analysis of corporate documents. The "Sources" column lists the initiatives and measures on which the scoring was based. In evaluating the scores, we considered the scope of the programs (local or global), the degree of integration (regular or ad hoc initiatives), and measurability (quantitative data such as Spar's proportion of domestic suppliers).

Table 2

Comparison of sustainability strategies using the radar chart method

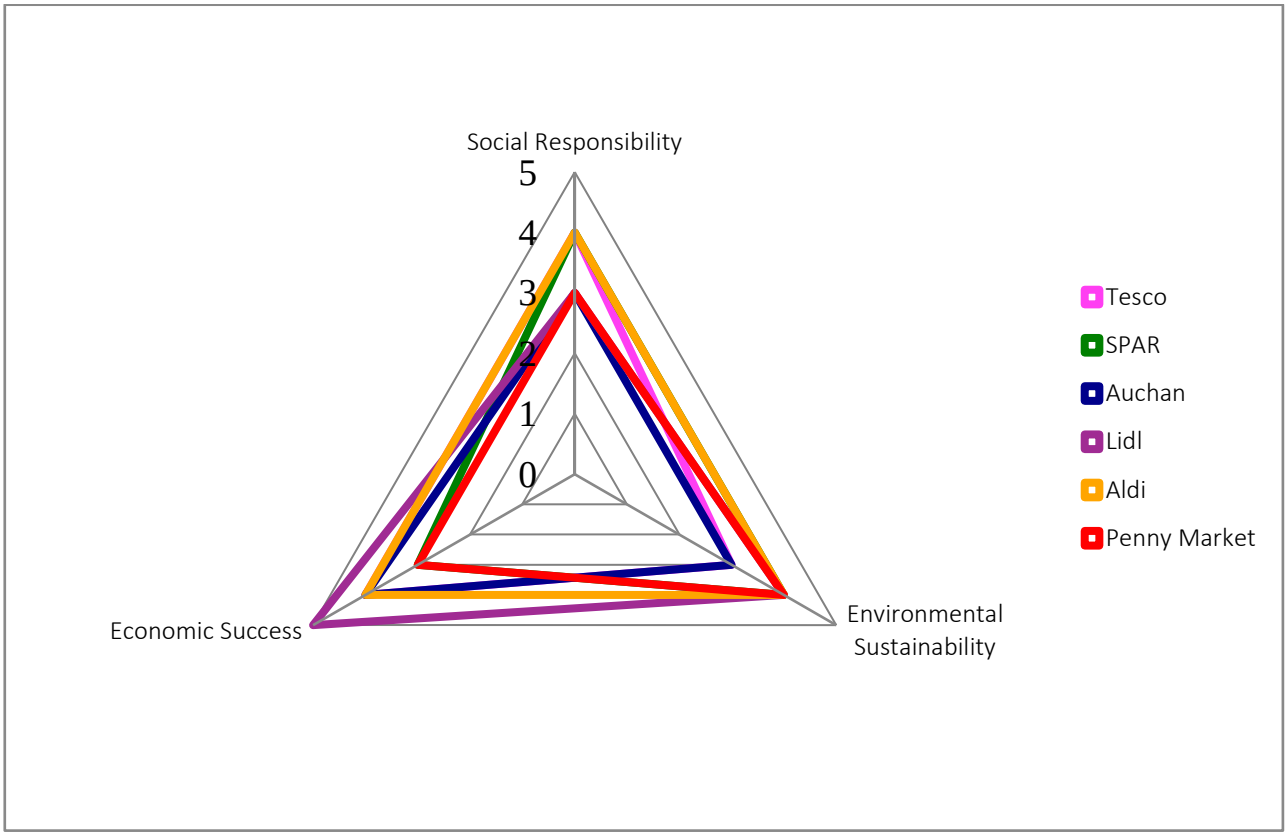
Retail Chains	*Social Responsibility*	*Environmental Sustainability*	*Economic Success*	*Sources*
Tesco	4	3	4	Tesco Perfectly Imperfect program; food donation, (The Guardian, 2020; The Times, 2021)
Spar	4	4	3	Domestic supplier ratio >90%; energy-efficient developments; SPAR sustainability report, (BCSDH, 2022; Trade Magazin, 2024b)
Auchan	3	3	4	AI-based inventory management and markdown, (Smartway, FWMS); hypermarket energy (CSR Hungary, 2023a)
Lidl	3	4	5	Automated warehouse and logistics, robotic pallet handing, e-trucks, (Robotics & Automation Magazine, 2023; Trade Magazin, 2024a; Vanderlande, 2022)
Aldi	4	4	4	57% reduction in food waste in the UK, circural packaging targets, (ALDI UK, 2023; ALDI SÜD Group, 2024)
Penny Market	3	4	3	ISO 50001 certification, solar panel investments, Munch cooperation, (Civilhetes, 2021; Trade Magazin, 2023b)

Source: Based in sustainability reports, own calculation

4. TRIANGLE MODEL OF HYPERMARKETS AND DISCOUNT STORES

The sustainability triangle model of food retail chains is built on the following dimensions: (1) **economic success**: revenue, market share, and growth potential, (2) **social responsibility**: support for employees, consumers, and local communities, and (3) **environmental sustainability**: reducing the ecological footprint through energy efficiency and waste management.

The key message of the model is that true sustainability can only be achieved if all three dimensions are in proper balance (Figure 1).



Source: own calculation

Figure 1: The sustainability model of hypermarkets and discount stores

Based on the model, it can be concluded that in Tesco's case, outstanding performance is observed in the dimension of social responsibility, primarily supported by the *Perfectly Imperfect* program and food donation practices (The Guardian, 2020; The Times, 2021, 2023). At the same time, its environmental performance is constrained by its large logistical footprint and the complexity of its supply chain (The Guardian, 2022). A key part of Tesco's strategy is robotization and digitalization, which enable more efficient inventory management, supply chain operations, and consumer demand forecasting.

SPAR shows strengths in both environmental and social dimensions: the share of domestic suppliers exceeds 90%, while its food rescue programs and energy-efficient solutions (e.g., modernization of refrigeration technology) contribute to its sustainability performance (BCSDH, 2022; Trade Magazin, 2024b). In Hungary, SPAR cooperates with the Munch app to sell products close to expiration but still consumable, while surplus from INTERSPAR stores is regularly donated to charity organizations such as the Hungarian Maltese Charity Service (BCSDH, 2022) and the Hungarian Food Bank.

Auchan's strategy is more pronounced in the dimensions of economic success and innovation, particularly through the introduction of AI-based inventory optimization and markdown systems (Smartway, FWMS), which enable the rescue of millions of products annually (Zebra Technologies, 2022; CSR Hungary, 2023b). However, its environmental footprint is still significantly influenced by the high energy demand of its hypermarket formats. Automation and robotization play an increasingly important role in Auchan's operations. Nonetheless, its sustainability strategy also faces limitations, since the implementation of automated and AI-based systems requires substantial investments, which place a heavy burden on the chain.

Lidl performs the strongest at the intersection of economic success and environmental sustainability. Its automated warehouse solutions, robotic pallet handling, and logistical innovations contribute to efficient operations, while its energy-efficient hubs and electric truck deliveries reduce its environmental impact (Robotics & Automation Magazine, 2023; Vanderlande, 2022; TechHQ, 2024). A central element of Lidl's sustainability strategy is food waste reduction, supported by digital and AI-based tools. Its *Project Wasteless* program, for instance, uses AI solutions to manage products nearing expiration, enabling discounted sales and faster turnover.

Aldi shows balanced performance across all three dimensions. Its achievements in food waste reduction, packaging and circular economy targets, as well as digitalization and AI-based logistics solutions all contribute to its sustainability performance (Aldi UK, 2023; AI Expert Network, 2023; Celonis, 2022; Aldi Süd Group, 2024).

Penny Market's sustainability strategy in Hungary rests on several pillars: food waste reduction, supported by its cooperation with the Munch app; improvements in energy efficiency and renewable energy use; and strengthening corporate social responsibility. The chain has made significant progress in environmental sustainability, demonstrated by its ISO 50001 energy management certification, solar panel investments, and electric charging network, which support its commitment to climate neutrality (Civilhetes, 2021; Trade Magazin, 2023a). Its strategy also emphasizes greener transport and logistics. However, its performance in social responsibility and economic success is less remarkable, partly due to the nature of the discount model.

On the digitalization-robotization axis, the companies show different levels of maturity. Auchan experiments both in-store (AI-supported markdowns and labelling) and in format innovation (*unmanned "Auchan GO"*), serving the dual goal of enhancing customer experience and reducing losses (Hungary Today, 2022; CSR Hungary, 2023b). Lidl primarily focuses on warehouse automation, while Aldi deepens AI-based logistics decision support and tracking of sustainability KPIs (Robotics & Automation Magazine, 2023; AI Expert Network, 2023; CSR Hungary, 2023c). SPAR and Penny Market, embedded in local ecosystems, approach sustainability through practically scalable digital tools (dynamic pricing, food rescue platforms). Although there is limited evidence of physical robotization, they have already documented progress in energy and waste management (Trade Magazin, 2024b, 2023a; Civilhetes, 2021).

Based on our analyses, we can conclude that for all six food retail chains, the common denominators are reducing food waste and enhancing energy-efficiency strategies; however, they rely on different sets of tools and operate at varying levels of maturity to achieve these goals. Lidl and Aldi demonstrate notable progress in warehouse automation and data-driven logistics optimization; SPAR and Penny Market leverage domestic ecosystem connections and achieve measurable benefits through pragmatic digitalization and energy management solutions. For all actors, the next development cycle will hinge on strengthening data integrity and supply chain transparency, expanding AI solutions, securing green energy supply, and broadening circular packaging and upstream innovations. The study highlights the strengths and weaknesses of the chains' strategies and enables comparison along the three dimensions mentioned above. The visual representation provided by the radar chart helps decision-makers review the data of each chain and identify areas requiring improvement. However, it is also important to acknowledge the study's limitations. The scoring is qualitative, which may introduce subjectivity, and it relies on publicly available sources; therefore, internal corporate practices and data could not be incorporated into the analysis.

5. Summary

In Hungary, the food retail sector is dominated by multinational chains (Tesco, SPAR, Auchan, Lidl, Aldi, and Penny Market), which approach the issue of sustainability from different perspectives. What they have in common is that although they have made progress in several areas, none of them can fully achieve a balance between economic success, social responsibility, and environmental sustainability. Tesco's strength lies in its fight against food waste, supported by several innovative programs and cooperation with civil partners. At the same time, its environmental impact related to transport and logistics remains significant. Aldi's rapid growth is underpinned by energy-efficient and cost-effective operations, but its narrower product range makes it less capable of involving local producers. Auchan's advantage is its support for the local economy and environmentally friendly initiatives, but its sustainability strategy is less transparent. Lidl's main strength is its strict supplier control and the development of sustainable private-label products, though its discount model also entails increased transport burdens. Overall, it can be concluded that while the chains operating in the Hungarian market show strengths in certain areas, none of them are able to fully represent all dimensions of sustainability at the same time. At present, they tend to focus on specific priority areas, and sustainability often serves more as a tool in market competition and in strengthening consumer trust. The greatest challenge for the future will be whether they can find the right balance between economic, social, and environmental goals, as only then can they remain credible and competitive in the long run.

Acknowledgment

The author would like to thank anonymous reviewers for their supportive comments and suggestions.

Author's contribution

Tamás Sikos T.: Created ideas and hypotheses for study 50%, conceived and designed the study 50 %, collected the data 50%, performed the formal analysis 50%, validated the data and results 50 %, wrote the original draft 50 %, reviewed and edited the paper 50%, overall: 50 %.

Laura Nagy: Created ideas and hypotheses for study 50%, conceived and designed the study 50 %, collected the data 50%, performed the formal analysis 50%, validated the data and results 50 %, wrote the original draft 50 %, reviewed and edited the paper 50%, overall: 50 %.

Disclosure statement

No potential competing interest to declare by the authors.

Funding

The author received no direct funding for this research.

Data availability statement

The data that support the findings of this study are available from the corresponding author, **Laura Nagy** laura.fekete63@gmail.com, upon reasonable request.

REFERENCES

AI Expert Network (2023). *C Case study: ALDI leverages AI for global efficiency and sustainability.*. https://aiexpert.network/case-study-aldi-leverages-ai-for-global-efficiency-and-sustainability

ALDI SÜD Group (2024). *Circularity strategy.* https://sustainability.aldisouthgroup.com/focus-areas/circularity

ALDI UK. (2023). *Food waste reduction.* https://www.aldi.co.uk/corporate/corporate-responsibility/greener/food-waste

Aldi UK. (n. d.). *Green energy*. https://www.aldi.co.uk/corporate/corporate-responsibility/greener/energy-and-transport-efficiency

Andersson, A. (2019). The trade effect of private standards. *European Review of Agricultural Economics, 46*(2), 267-290. https://doi.org/10.1093/erae/jby027

BCSDH (2022). *SPAR Hungary publishes first sustainability report.* https://bcsdh.hu/en/member-news/spar-hungary-publishes-first-sustainability-report/

BCSDH (2023). *SPAR Hungary switches to environmentally conscious fruit & veg containers.* https://bcsdh.hu/en/member-news/spar-hungary-switches-to-environmentally-conscious-fruitveg-containers/

Bemelmans, J., Curzi, D., Olper, A., & Maertens, M. (2023). The trade effects of voluntary sustainability standards in tropical commodity sectors. *Food Policy, 118,* 102440. https://doi.org/10.1016/j.foodpol.2023.102440

Bennett, E. A (2017). Voluntary sustainability standards: A squandered opportunity to improve workers' wages. *Sustainable Development, 26*(1), 65-82. https://doi.org/10.1002/sd.1691

Berning, L., & Sotirov, M. (2023). Hardening corporate accountability in commodity supply chains under the European Union deforestation regulation. *Regulation & Governance, 7*(4), 870–890. https://doi.org/10.1111/rego.12540

Celonis (2022). *How ALDI SÜD plans to turn sustainability and logistics into a win-win.* https://www.celonis.com/blog/how-aldi-sud-plans-to-turn-sustainability-and-logistics-into-a-win-win

Civilhetes (2021). *Fenntarthatósági tanúsítványt kapott a Penny Market.* https://civilhetes.net/fenntarthatosagi-tanusitvanyt-kapott-a-penny-market

CSR Hungary. (2023a). *MI-alapú applikáció az Auchanban az élelmiszermentésért.* https://csrhungary.eu

CSR Hungary (2023b). *Mesterséges intelligencián alapuló applikáció támogatja ezentúl az élelmiszermentést az Auchanban.* https://csrhungary.eu/meg-tobb/vallalati_hirek/mesterseges-intelligencian-alapulo-applikacio-tamogatja-ezentul-az-elelmiszermentest-az-auchanban/

CSR Hungary (2023c). *Lidl Hungary sustainability initiatives.* https://csrhungary.eu

Easterly, W. (2015). The trouble with the Sustainable Development Goals. *Current History, 114*(775), 322–324. https://doi.org/10.1525/curh.2015.114.775.322

Elamin, N. E. A., & Fernandez de Cordoba, S. (2020). The trade impact of voluntary sustainability standards: A review of empirical evidence. *UNCTAD Research Paper, No. 50.* (https://unctad.org/system/files/official-document/ser-rp-2020d9_en.pdf

Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business.* Gabriola Island: New Society Publishers.

Fiankor D-D. D, Flachsbarth, I., Masood, A., & Brümmer, B. (2020). Does GlobalGAP certification promote agricultural exports? *European Review of Agricultural Economics, 47*(1), 247–272. https://doi.org/10.1093/erae/jbz023

Hahn, T., Pinkse, J., Preuss, L., & Figge, F. (2015). Tensions in corporate sustainability: Towards an integrative framework. *Journal of Business Ethics, 127*(2), 297-316. https://doi.org/10.1007/s10551-014-2047-5

Hungary Today (2022). *Auchan opens unmanned smart store in the capital.* https://hungarytoday.hu/auchan-opens-unmanned-smart-store-in-the-capital

Kotsantonis, S., Pinney, C., & Serafeim, G. (2016). ESG integration in investment management: Myths and realities. *Journal of Applied Corporate Finance, 28*(2), 10–16. https://doi.org/10.1111/jacf.12169

Kozma, T. (2019). Fenntarthatósági mutatók és vállalati teljesítménymérés. *Vezetéstudomány / Budapest Management Review, 50*(12), 2–14. https://doi.org/10.14267/VEZTUD.2019.12.01

Lidl fenntarthatósági jelentés. (2025). *Reset plastic*. https://vallalat.lidl.hu/fenntarthatosag/kornyezet/reset-plastic

Marx, A. et al. (2024). Global governance through voluntary sustainability standards: Developments, trends and challenges. *Global Policy, 15*(4), 708-728. https://doi.org/10.1111/1758-5899.13401

Marx, A., Dietz, T., Elamin, N. E. A., & Fernandez de Cordoba, S. (2021). *Better trade for sustainable development: The role of voluntary sustainability standards (VSS).* United Nations Conference on Trade and Development (UNCTAD). https://unctad.org/system/files/official-document/ditctab2021d2_en.pdf

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The limits to growth*. New York: Universe Books.

Mosley, H., & Mayer, A. (1999). Benchmarking national labour market performance: A radar chart approach. *Discussion Papers*, Research Unit: Labor Market Policy and Employment, FS I 99-202, WZB Berlin Social Science Center.

Robotics & Automation Magazine. (2023, September 12). *New Lidl warehouse is first in Britain to use automation.* https://www.roboticsandautomationmagazine.co.uk/news/warehousing/new-lidl-warehouse-is-first-in-britain-to-use-automation.html

Sikos T., T., & Szendi, D. (2024). A hazánkban működő élelmiszer-ellátási láncok hálózatának formálódása, 1989-2023. *Területi Statisztika, 64*(4) 448-466 https://doi.org/10.15196/TS640402

Sikos T., T. (Szerk.). (2019). *Az élelmiszer-ellátási láncok sérülékenysége.* Budapest: Ludovika Kiadó. https://doi.org/10.36250/00687_00

TechHQ. (2024). *Lidl Sweden: We're bringing electric trucks to the supply chain.* https://techhq.com/news/lidl-sweden-were-bringing-electric-trucks-to-the-supply-chain

The Guardian. (2020). *Tesco pledges to halve food waste by 2020.* https://www.theguardian.com/europe

The Guardian. (2022). *Tesco accused of misleading on food waste figures.* https://www.theguardian.com/europe

The Times. (2021). *Tesco donates surplus food to charities.* https://www.thetimes.co.uk

The Times. (2023, March 14). *Tesco to give away free food to cut waste.* https://www.thetimes.co.uk/article/tesco-to-give-away-free-food-to-cut-waste-00hs8sk23

Trade Magazin. (2023a). *A fenntarthatóság a helyes út a Penny-nél.* https://trademagazin.hu/en/a-fenntarthatosag-a-helyes-ut-a-penny-nel-innovaciok-uttoro-megoldasok-es-segitsegnyujtas-a-kiskereskedelmi-uzletlancnal

Trade Magazin. (2023b). *Összefogott a Penny és a Munch az élelmiszer-pazarlás ellen.* https://trademagazin.hu/en/osszefogott-a-penny-es-a-munch-elelmiszermentessel-a-pazarlas-ellen

Trade Magazin. (2024a). *A Lidl Magyarország fenntarthatósági céljai*. Trade Magazin. https://trademagazin.hu/en/a-lidl-magyarorszag-fenntarthatosagi-celjai/

Trade Magazin. (2024b). *48%-kal kevesebb energiafogyasztás, 90% hazai forrás az élelmiszereknél a SPAR új fenntarthatósági mérlege.* https://trademagazin.hu/en/48-kal-kevesebb-energiafogyasztas-90-hazai-forras-az-elelmiszereknel-a-spar-uj-fenntarthatosagi-merlege/

Vanderlande. (2022). *Lidl and Vanderlande extend cooperation with state-of-the-art ACP system.* https://www.vanderlande.com/us/news/lidl-and-vanderlande-extend-cooperation-with-state-of-the-art-acp-system

Veresné Somosi, M., & Sikos T., T. (Szerk.). (2023). *A fenntarthatóság holisztikus megközelítésben*. Budapest: Akadémiai Kiadó. https://doi.org/10.1556/9789634549314

WCED (World Commission on Environment and Development). (1987). *Our common future*. Oxford: Oxford University Press.

Zebra Technologies (2022). *Auchan adopts Zebra solution to save 35 million products from food waste annually.* https://www.zebra.com/us/en/about-zebra/newsroom/press-releases/2022/auchan-adopts-zebra-solution-to-save-35-million-products-from-food-waste-annually.html

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THEORY METHODOLOGY PRACTICE | Review of Business and Management
2025 VOLUME 21 NUMBER 2
https://doi.org/10.18096/TMP.2025.02.04

Corporate Governance–Performance Nexus in Indian Insurance Companies: A Sectoral Assessment of Life vs. Non-Life sector

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SUMMARY

Corporate governance is one of the key sustainability indicators to manage and control the business functions ethically and transparently. This mechanism is essential in every sector, specifically in the insurance landscape, to strategically meet uncertain risk & losses and enhance long term value for the stakeholders. This study examines the corporate governance practices followed by the life and non-life insurance industry in India and its effect on the financial performance of insurers. To provide empirical results of the study, we considered corporate governance as independent variables, financial performance as dependent variables, and control variables for validation and reliability of the results. Secondary data was collected from a sample of ten insurance companies, including five life and five non-life insurers, covering 10 years from 2014 to 2023. Statistical tools & techniques such as descriptive statistics, t-tests, and regression analysis were implied to test hypothesis. The result reveals that across the life and non-life insurers, unified governance mechanisms are followed, but it substantially influences the financial performance of life insurance than the non-life insurance sector. The core reasons behind that are life insurance contracts for long-term liabilities, complex investment portfolios, greater information asymmetry, and the highly sensitive agency problem. So, the life insurance industry requires formulating more stringent governance mechanisms that sustainably address unstable operations and performance landscapes. The outcome of this study would structure robust governance norms, which would eventually enhance Indian insurers' performance sustainably and discover the insight contributions of this field of research in an emerging economy scenario.

HOW TO CITE:
Swain, B., & Dey, S. K. (2025). Corporate governance–performance nexus in Indian insurance companies: A sectoral assessment of life vs. non-life sector. *THEORY METHODOLOGY PRACTICE: Review of Business and Management, 21*(2), 44-61. https://doi.org/10.18096/TMP.2025.02.04

ARTICLE HISTORY
Received 13 September 2025
Revised 06 October 2025
Accepted 17 December 2025
Published 30 December 2025

KEYWORDS
Corporate governance, financial performance, Insurance Industry, Life and Non-life sector

JEL CLASSIFICATION
G0, G34, G22

1. INTRODUCTION

In the recent year, the insurance industry in India has undergone a significant change by driving the economic uncertainty and efficient utilization of the country's financial resources for economic growth and development. This transformation is obsessed with many influencers, such as dynamic economic growth, uncertain risk and losses management, security for future savings, emerging technology, and compliance mechanisms in the circular economy. As per the growing perspective, the Indian insurance sector will be the 6th largest market potential by 2032, and the Insurance Regulatory Development Authority (IRDA) sets a mission for insurance for all by 2047. IRDA is continuously regulating and insightfully transforming the Indian insurance sector, keeping pace with global needs (Dash and Pany, 2013). The economic reform of liberalization enforces magnificent growth in the Indian insurance market by allowing the entry of the private sector, low

insurance premiums, immediate claim settlement policies, innovative insurance products and services, policyholder awareness, more distribution channels, etc. (Satish, 2019). In the current scenario private insurers are holding 37% of the market share in life insurance coverage and 55% of the market holding in non-life insurance coverage. It plays a pivotal role in defending human life and property from financial risk and losses. However, due to the emerging economic development, the insurance industry faces some challenges such as demand conditions, market competitions, product innovations, delivery and distribution systems, technological transformation, and regulation (Krishnamurthy et al., 2005). It further faces the challenges of low penetration, density rates, and inequalities covering mortality resilience. According to the Organization for Economic Cooperation and Development (OECD), corporate governance mechanisms become necessary for directing and controlling the business operations ethically and transparently. This framework introduces an integrated policy process model to address the practicality of developing and implementing a robust, dynamic governance system with a focus upon disclosure practices and legitimacy to protect the stakeholder interest through mitigating such systematic issues and challenges (Kelly et al., 2022).

However, the evolutionary landscape of corporate governance is very much essential for any corporate sector, especially in financial institutions, to sustainably address their financial crises, scandals, and misappropriation of corporate disclosure practices (Magee et al. 2019). Corporate governance landscape in India has impressed significant growth, like other emerging economies, with special enactment of Sarbanes-Oxley-type measures in U.S. aim to strengthen financial transparency, accountability, and internal controls (Chakrabarti et al., 2009). In the volatile economy, the insurance industry has imposed greater attention for robust governance structure, particularly in board oversight, auditing, and effective risk management to protect the interest of policyholders (Ajemunigbohun et al., 2020). Meanwhile, the structural differences between the governance practices and organizational framework demonstrate the procurement of theoretical ambition in business operations and strategic decisions. The pivotal corporate governance theories, such as agency theory, stewardship theory, institutional theory, and stakeholder theory, have enforced greater attention to meeting the strategic efficiency of financial return and long-run value for all stakeholders (Goyal and Gulati, 2025). The application of governance theories in the insurance context reduces agency issues among the policyholders, shareholders, and managers in a multidimensional network. It suggests appointing limited directors to the board, which should consist of a majority of independent directors, separating the roles of CEO and chairperson, and forming an audit committee for validation of disclosure and reporting practices. Managers of insurance companies strengthen the CG measures to help mitigate the agency conflict and associated costs between management and shareholders (Tackie et al., 2022). The stewardship theory is inversely related to the agency theory, which aligns the principal and agent interests to achieve a common business goal and objective. Further, the institution theory signifies that insurer structure is influenced by the social expectations, regulatory frameworks, and industry norms for effective claim settlement and compliance mechanisms. Lastly, stakeholder theory demonstrates its responsibility not only for the principal but also for meeting the interests of all stakeholders with a logical balance of both internal and external affairs of the company through the appointment of more independent directors and strategic decisions by the audit committee. Goyal and Gulati (2024) also define the practical implication of governance theories in the insurance market as better control over managers' opportunistic behavior, quality of financial reporting, enhanced financial outcomes, and fostering of favorable business environments for better risk management. Overall, the primary focus of this study is to assess the governance mechanisms that are followed by the life and non-life insurers in India and their effect on financial performance.

2. Literature Review And Hypothesis Development

Over the decade, the concept of the corporate governance has gained momentum in the emerging economy to maintain ethical standard and best code of organizational practices. A good quality of corporate governance has been necessitated at any corporation, including those in the manufacturing and financial service sectors, to efficiently readdress their legislative regulations and long run stakeholder satisfaction. Considering the paramount importance of governance systems in the financial service sector, Handley-Schachler et al. (2007) defined that sound governance practices cover the issues of leverage and asset-liability mismatch through obeying statutory regulations and independent audit functions. In the emerging economy, insurance companies play a prominent role in assessing the uncertain risk and ensuring security in the form of financial protection against such risk and losses. So Fadun (2013) advocated that effective corporate governance is necessary in order to enhance accountability, fairness and transparency in insurer operations and proper utilization of resources to support the economy welfare. Abdoush (2022) recommended that listed and non-listed insurance firms in the UK deliberately focus on well governance structure such as independent director in the board, non-duality roles, the presence of majority shareholders, and external audit firms during the turbulent situations. However, the Covid-19 pandemic enforced several economic misappropriations due to high mortality risk, so insurance companies were played catalytic role to Protecting households and businesses from unexpected cost and losses. For this fever, Kalia and Gill (2023) concluded that companies with strong governance mechanisms such as higher institutional ownership stakes, concentrated family ownership structures, lower CEO compensation and duality, more independent directors,

gender diversity, and socially responsible practices were better positioned to mitigate uncertain risk and losses in the volatile economy.

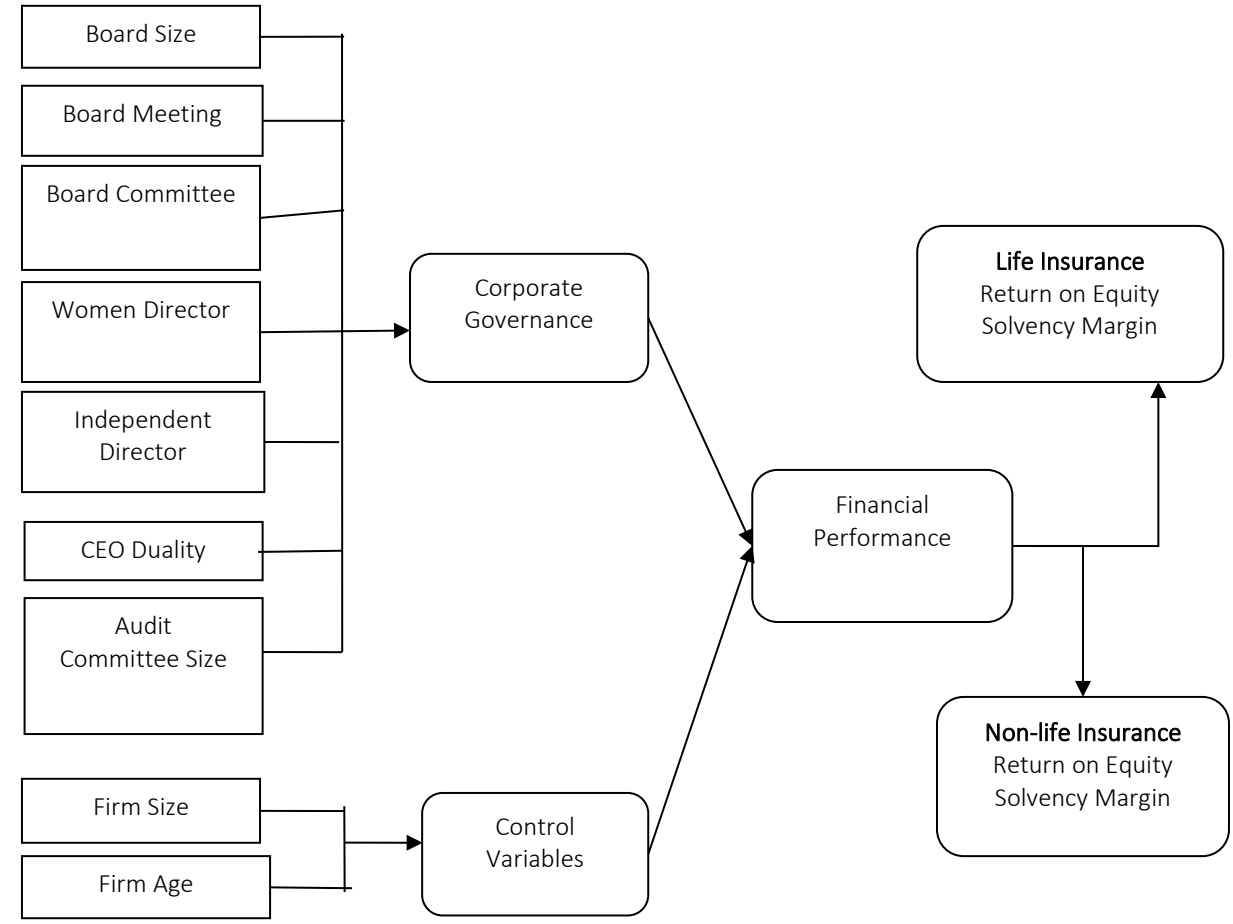
Consequently, both the life and non-life insurance industries provided their valuable insight contribution towards global financial inclusiveness, which taken as a crucial element for strategically meeting financial inclusion in cross-country prospects (Yap et al., 2025). In 2021, Fatma and Chouaibi examined the effect of corporate governance indicators on the firm value of 111 financial institutions belonging to 12 European countries listed on the stock exchange during the period 2007–2019. They found that firm value established an optimistic relation with gender diversity, CEO duality role, firm size, and age but a pessimistic one with board size and ownership structure. One of the studies conducted by Dagunduro et al. (2023) highlights two key governance aspects, such as promoting board diversity and independence that had positive consideration for the decision-making process and influenced the market value efficiency of Nigerian listed insurance firms. Corporate governance and financial performance have an intertwining association (Chebotibin, 2022). His study implied that a well-balanced board with independent internal and external interference would positively influence the financial performance and guarantee sustained market share growth. Alhassan et al. (2021) described the structural formation of the board committee and the independent audit committee function, which was responsible for addressing the agency issues and optimum utilization of resources to enhance the financial performance of the life insurer. In addition, Martínez-Ferrero and García-Sánchez (2017) defined that board independence was positively associated with firm sustainability assurance and choice of accounting profession and also empirically obtained a U-shaped relationship between the board size and assurance issues. In the year 2019, Maharjan found a strong relationship between corporate governance and financial performance of Nepal insurance companies in a sectoral assessment view. His study recommended that board responsibility towards corporate meetings, audit activity, and CEO duality functions inversely affect the ROA and ROE of insurance firms, where the control variable also influences positively. Adams and Jiang (2020) observed that board-level qualified accountants and actuaries were linked to enhanced financial outcomes of sample companies instead of underwriters, while underwriters were associated with sound solvency levels but not positive earnings-based measures.

Governance theory is the intellectual foundation to control, direct, and ensure ethical policy in the organizational structure. Ramadhan et al. (2022) stated that agency theory was the core of the charities of governance mechanisms, which empirically control the organizational conflict through appointing independent directors to the board, CEO non-duality roles, the formation of diversified board committees, and proper planning of executive compensation to align shareholders' goals with managers' goals. Further, stewardship theory contradicts traditional agency theory by addressing the discrepancy between ownership and control in corporations. Klettner (2021) evidenced that stewardship codes were influencing the shareholders' and managers' relationship to achieve the common goals and integration of wider economic and societal concerns into corporate finance. Hence, this theory liberalizes the policy, centralizes authority, and encourages collaboration among the members to work with trustworthy stewards of organizational goals. In addition, stakeholder theory in corporate governance focuses upon shaping board structure, strategic oversight, reporting, compensation, risk management, ethics, and considering the interests of all parties, thereby improving long-term performance and social value. Therefore, (Yensu et al., 2017; Anuolam and Ajagu, 2022) recommended corporate governance is essential for any corporate body, which demonstrates smooth operations of the firms, strategic guidance of the firm, and transparency in day-to-day operations by empirically execution of governance theories and practices. These reviews show that the insurance industry plays a pivotal role in securely addressing the economic uncertainty and volatility, but limited research has been done in this subject area. Further, it is the responsibility of the researcher and academician to address this undercover literature and fill up the potential gaps. Hence, as per the studied review gaps, we formulated the following hypothesis:

- H1: There is significant differences of corporate governance practices followed by life and non-life insurance industry in India
- H2: Corporate governance has significant impact on financial performance of life insurance industry.
- H3: Corporate governance has significant impact on financial performance of non-life insurance industry.

In addition, Figure 1 depicts the conceptual structure outlining broad relationship between the variables, concepts or ideas in a defined manner. The main purpose of this framework is to design research approach, hypothesis development and interpretation of results effectively and efficiently. By empirically structure this outline, it enhances research rigor and ensures findings are grounded in a clear theoretical context and make wide scope for future.

3. THEORETICAL FRAMEWORK



Source: Own edition

Figure 1: Purposed conceptual framework

4. RESEARCH OBJECTIVE

- To study the significant differences of corporate governance practices followed by life and non-life insurance industry in India
- To examines the impact of corporate governance on financial performance of life insurance industry.
- To examines the impact of corporate governance on financial performance of non-life insurance industry.

5. METHODOLOGY

The research utilizes secondary data from both life and non-life insurers operating in India. A non-probability sampling technique, i.e., purposive & convenience methods, has been utilized to select the top 5 insurance industries from each life & non-life insurance category as per their asset size as of 31st March 2023. Data has been collected from the annual report of sample companies for the period of 10 years covering 2013-14 to 2022-23 and also screened out the data as per the researcher's requirement. The broad composition of studied variables is classified into three categories. These variables are corporate governance indicators as independent variable, financial performance as dependent variables and two control variables such as firm size and age are considered to validate and reliable of the result. Moreover, the study adopts an ex post facto research design and applies statistical tools & techniques such as descriptive statistics, correlation,

t-tests, and multiple regressions to establish the relationship between the variables with SPSS software. For measuring the effect of corporate governance on financial performance in life and non-life insurance, we propose the following regression equations:

$$(ROE)_{it} = \alpha + \beta_1 (BS)_{it} + \beta_2 (BM)_{it} + \beta_3 (BC)_{it} + \beta_4 (WD)_{it} + \beta_5 (ID)_{it} + \beta_6 (CEOD)_{it} + \beta_7 (ACS)_{it} + \beta_8 (FA)_{it} + \beta_9 (FS)_{it} + \varepsilon_{it}$$

$$(SM)_{it} = \alpha + \beta_1 (BS)_{it} + \beta_2 (BM)_{it} + \beta_3 (BC)_{it} + \beta_4 (WD)_{it} + \beta_5 (ID)_{it} + \beta_6 (CEOD)_{it} + \beta_7 (ACS)_{it} + \beta_8 (FA)_{it} + \beta_9 (FS)_{it} + \varepsilon_{it}$$

The above regression equations have been applied in the life and non life insurance business separately to access the effect of governance indicators on two financial performance measurement i.e. ROE & SM. Respectively 'i' &'t' shows the firm and time factor of the sample study. 'ε_{it}'Represent the error term of firm 'i' at time't'. However, detail description of all variables which are used in this study is explained bellow Table 1.

Table 1

Variables' definition

Variables	Proxy	Definition
Performance measures		
Return on Asset	ROE	Ratio of profit after tax to shareholders' equity
Solvency Margin	SM	Ration of available solvency margin to required solvency margin
governance attributes		
Board Size	BS	Total number of directors on the board
Board Meeting	BM	Total number of directors' meetings held in a year
Board Committee	BC	Total number directors' committees formulated in a year
Women Director	WD	Total number of women director on the board
Independent Director	ID	Total number of Independent directors on the board
CEO Duality	CEOD	Dummy variable, 1 if the same individual holds the position of chairman and CEO, otherwise 0
Audit Committee Size	ACS	Total number directors' in the audit committee
Control variables		
Firm Size	FS	Log of total assets
Firm Age	FA	log of number of years since Establishment

Source: Author compilation

6. RESULTS & DISCUSSION

6.1. Descriptive Statistics

Descriptive statistics is a statistical technique to describe or summaries the set of data. This is useful in helping to appreciate the main features of any given set of data, such as the central tendency (mean, median and mode) and dispersion (range, variance and standard deviation). The importance of descriptive statistics is that it helps to analyze the data without making extrapolation or assumptions concerning the larger population.

Both Table 2 and 3 represent the descriptive result of the studied variables in detail of the life and non-life insurance industries, respectively. We have seen that both the life and non-life insurance industries are not complying with governance guidelines regarding appointing women directors and independent directors to the board, because these facets do not meet the standard limit issued by IRDAI. The CEO duality role influences marginally, where the same person

occupies both chairperson and CEO positions, resulting in some bias and ineffective decision-making. In addition, the BS followed by BM and BC have showing maximum mean value and also met the standard limit of governance guidelines. This signifies that both life and non-life insurers have serious concerns in regard to composing their board structure, having multiple board committees to reduce grievances, and holding periodic board meetings as per rules and regulations. It also observes that both categories of insurer are independently appointing auditors for systematic evaluation and authentic financial reports. The financial performance measurement ROE is highly deviated from SM and generates negative value in the non-life insurance category. It typically represents financial instability and unstable management performance, increasing financial risk for the investors. The skewness statistic shows that all governance facets in both industries are positively skewed except the CEO in non-life insurance. This indicates all independent variables are highly asymmetric from their frequency distributions.

Table 2

Descriptive result of Life insurance industry

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
BS	50	8	19	12.26	2.66351	0.161	-0.717
BM	50	4	15	6.52	2.74226	1.61	1.819
BC	50	5	13	8.7	1.54193	0.529	1.505
WD	50	0	4	1.78	0.84007	0.443	-0.334
ID	50	0	11	5.58	2.50787	0.08	0.106
CEOD	50	0	1	0.02	0.14142	7.071	50
ACS	50	4	11	6.84	1.86657	0.203	-0.469
AGE	50	1.08	1.82	1.3664	0.24582	1.01	-0.622
SIZE	50	1.25	3.49	2.7167	0.67396	-1.169	-0.006

Source: Authors' calculation

Table 3

Descriptive result of non-life insurance industry

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
BS	50	4	15	8.68	2.8388	0.568	-0.298
BM	50	5	15	7.32	2.22637	1.347	2.064
BC	50	6	12	8.42	1.98041	0.173	-1.09
WD	50	0	5	1.92	1.14	0.679	-0.179
ID	50	1	8	3.44	1.7975	0.859	0.071
CEOD	50	0	1	0.96	0.19795	-4.841	22.331
ACS	50	3	12	5.84	2.64467	0.987	0.005
AGE	50	4.8	8.59	7.4321	1.2597	-1.303	0.095
SIZE	50	1.62	2.06	1.8707	0.14118	-0.149	-1.306
ROE	50	-1083.4	119.8	-72.992	253.944	-3.255	10.052

Source: Authors' compilation

6.2. Collinearity Statistics

Before applying regression in panel data, the multicollinearity issue should be addressed by the researcher. Multicollinearity means there was the same and a high degree of correlation among the independent variables, which can affect the model estimator. This collinearity can be known from the VIF (Variance Inflation Factor) and tolerance value.

Hair et al. (2013) evidenced that the threshold limit of the VIF value is less than 5 and the tolerance limit (1/VIF) lies between 0 and 1, which confirms the panel dataset is free from the co-linearity problem. Table 4 represents that, all independent variables are meeting the standard limit and proceed further to obtain valid results.

Table 4

Co-linearity Statistics

	Life Insurance		Non-life insurance	
Variables	VIF	Tolerance	VIF	Tolerance
BS	1.713	.584	3.969	.252
BM	2.393	.418	1.853	.540
BC	2.558	.391	4.236	.191
WD	1.415	.707	2.659	.376
ID	2.342	.427	2.238	.447
CEOD	1.638	.610	1.279	.782
ACS	1.482	.675	2.830	.353
FS	1.280	.781	2.102	.476
FA	2.772	.361	3.453	.290

Source: Authors' Compilation

6.3. Correlation Analysis

In statistics, correlation analysis is a technique employed to determine the degree and nature of association between two variables. Tables 5 and 6 represent the Pearson correlation value between two explanatory variables in life and non life insurance industry respectively. All the correlation results in this table are less than 0.70; hence, there was no possibility of multicollinearity among the variables (Hair et al., 2017). In both tables, we have seen that corporate governance indicators are correlated positively and inversely. This result signifies a complex structure of governance framework is framed in life and non-life insurers, which influence each governance facet in different ways. It also measures the same relation when control variables i.e. FA and FS correlate with governance variables. In life insurance companies, financial performance ROE is positively correlated with BC, WD, and CEOD and negatively related to BS, BM, ID, and ACS. In addition, another performance measurement variable, SM, also negatively associates with more governance indicators, like BM, BC, WD, ID, and CEOD, except BS and ACS. This indicates governance facets of the life insurance business are more associated with ROE than SM. It says that effective boards, diverse workforces, proper audit functions, and appropriate leadership roles have much more influence on life insurer performance. Further, in the non-life insurance industry view, ROE is negatively correlated with BS, BM, BC, and CEOD, and another financial measurement, SM, is mostly positively associated with governance indicators such as BS, WD, ID, CEOD, and ACS. This indicates the solvency margin of the non-life insurer is much more influenced by the governance rules and practices than by equity shareholders' return, because the non-life firm faces higher risk exposure and shorter-term liability duration against uncertain risk & losses than the life insurer.

Table 5

Correlation statistics of life insurance

	BS	BM	BC	WD	ID	CEOD	ACS	FA	FS	ROE	SM
BS	1										
BM	-0.217	1									
BC	-0.174	0.385	1								
WD	0.272	-0.277	0.169	1							
ID	0.234	0.442	0.025	-0.142	1						
CEOD	0.148	0.446	0.402	0.038	0.197	1					

ACS	0.374	0.124	-0.272	0.042	0.286	-0.065	1				
FA	-0.289	0.102	0.615	0.135	-0.468	0.266	-0.364	1			
FS	0.104	0.143	-0.467	-0.112	0.506	-0.227	0.485	-0.777	1		
ROE	-0.331	-0.17	0.423	0.17	-0.54	0.013	-0.467	0.705	-0.826	1	
SM	0.464	-0.228	-0.689	-0.248	-0.033	-0.069	0.356	-0.417	0.233	-0.45	1

Source: Authors' compilation

Table 6

Correlation statistics of Non-life insurance

	BS	BM	BC	WD	ID	CEOD	ACS	FS	FA	ROE	SM
BS	1										
BM	0.01	1									
BC	-0.291	0.455	1								
WD	0.471	-0.014	-0.374	1							
ID	0.56	-0.117	-0.5	0.476	1						
CEOD	-0.023	0.076	-0.269	0.076	0.108	1					
ACS	0.594	-0.189	-0.622	0.382	0.672	0.143	1				
FA	0.17	0.049	0.38	-0.331	-0.051	-0.087	0.052	1			
FS	-0.061	0.381	0.748	-0.445	-0.254	-0.246	-0.234	0.789	1		
ROE	-0.204	-0.349	-0.347	0.043	0.189	-0.021	0.194	-0.055	-0.257	1	
SM	0.425	-0.311	-0.505	0.316	0.553	0.079	0.439	0.087	-0.215	0.165	1

Source: Authors' compilation

6.4. Hypothesis testing and Regression result

- H1: There are significant differences of corporate governance practices followed by life and non-life insurance industry in India

Table 7

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Life	6.1560	5	.38429	.17186
	Nonlife	5.4500	5	.55946	.25020

Source: Authors compilation

Table 8

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Life & Nonlife	5	.035	.955

Source: Authors compilation

Table 9

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Life - Nonlife	.70600	.66752	.29852	-.12283	1.53483	2.365	4	.077

Source: Authors' calculation

To test the significant difference of corporate governance practices followed by both sectors, we have applied a paired t-test. This statistical test is used to compare the observation of one group with the observation of another group. In other words, this test measures to evaluate the mean value of two related groups to justify significant differentiations. Tables 7, 8 and 9 show the t-test results. It is observed that the mean value of sample life insurance sectors (6.1560) is more than non-life insurers (5.4500). This means corporate governance guidelines are more strategically complied by the life insurer than non life insurer. Moreover, the p-value is 0.077, which is more than the 5% level of significance; we reject the alternative hypothesis and conclude that there is no significant difference in corporate governance practices of sample insurance companies irrespective of sectoral differences. In other words, both life and non-life insurers in India follow IRDAI governance guidelines; hence, governance structures have no discernible differences and are unified in all types of insurance businesses.

- H2: Corporate governance has significant impact on financial performance of life insurance industry

Table 10

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.888[a]	0.789	0.735	63.53222

a. Predictors: (Constant), SIZE, BS, RMCS, CEOD, WD, BC, ID, ACS, BM, AGE

b. Dependent Variable: ROE

Source: Authors' calculation

Table 11

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	588802.563	10	58880.256	14.588	.000[b]
	Residual	157417.397	39	4036.344		
	Total	746219.961	49			

a. Dependent Variable: ROE

b. b. Predictors: (Constant), SIZE, BS, CEOD, WD, BC, ID, ACS, BM, AGE

Source: Authors' calculation

Table 12

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	499.72	172.22		2.902	0.006
BS	-11.138	4.934	-0.24	-2.257	0.030
BM	-2.479	5.411	-0.055	-0.458	0.649
BC	5.372	9.198	0.067	0.584	0.563
WD	18.268	12.779	0.124	1.429	0.161
ID	-2.582	5.561	-0.052	-0.464	0.645
CEOD	-107.167	83.412	-0.123	-1.285	0.206
ACS	-0.873	7.39	-0.013	-0.118	0.907
FA	2.596	75.819	0.005	0.034	0.973
FS	-137.041	26.655	-0.748	-5.141	0.000

a. Dependent Variable: ROE

Source: Authors' calculation

The above Tables 10, 11 & 12 summarize the impact of governance indicators on the ROE of life insurers in India. The p-value of ANOVA is 0.000, which is less than a 5% level of significance. We reject the null hypothesis so we can say that model exists, or in other words, governance facets mutually influence the ROE of life insurers. In the model summary, the R-squared value is 0.789, which discovers 78.9 percent of variation of ROE is bitterly explained by the governace indicators. Hence, it is the best measurement to accurately establish the relationship between the dependent and independent variables.

However, to access the individual effect of governance facets on ROE of the life insurance sector, we employed regression coefficients in Table 12. We have seen that BM, ID, CEOD, ACS negatively and BC & WD positively insignificant relation with ROE of life insurance sector, because P-value is more than 5% level of significance. This significance value is an exception in the case of BS (0.030), which negatively influences ROE. The reason behind these larger board sizes is that they create agency problems, slow down decisions, weaken oversight quality, increase costs, and reduce the expected return of equity shareholders. Further, the control variable FS significantly influences the financial performance. Hence, the expected return of equity shareholders varies with total asset volume and level of utilization of resources to cover mortality risk.

Table 13

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	0.76	0.699	1.17008

a. Predictors: (Constant), SIZE, BS, CEOD, WD, BC, ID, ACS, BM, AGE

b. Dependent Variable: SM

Source: Authors' calculation

Table 14

ANOVA

Mode		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	169.206	10	16.921	12.359	.000[b]
	Residua	53.395	39	1.369		
	Total	222.601	49			

a. Dependent Variable: SM

Source: Authors' calculation

Table 15

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	10.657	3.172		3.36	0.002
BS	0.263	0.091	0.329	2.898	0.006
BM	0.105	0.1	0.135	1.054	0.298
BC	-0.835	0.169	-0.604	-4.931	0.000
WD	-0.653	0.235	-0.257	-2.773	0.008
ID	-0.148	0.102	-0.174	-1.441	0.158
CEOD	1.822	1.536	0.121	1.186	0.243
ACS	0.327	0.136	0.286	2.403	0.021
FA	-0.684	1.396	-0.079	-0.49	0.627
FS	-0.558	0.491	-0.176	-1.136	0.263

a. Dependent Variable: SM

Source: Authors' analysis

Tables 13, 14 and 15 define the regression result of selected governance indicators on the SM of the life insurance industry. As per the P-value (0.000) and R-squared (0.76) results, the model is best fitted to explain 76 percent variation of SM by all independent corporate governance indicators. The F value is 12.359 and statistically significant at the 5% level. There is strong evidence that at least one group mean is significantly different from the others. In the coefficient table, we have seen that BS, BC, WD, and ACS significantly influence the SM, because the p-value is less than 0.05. But this effect is insignificant at BM, ID, and CEOD. It signifies that the long-term solvency of a life insurer is more structured with board composition, multiple board committees, board diversity, and a systematic audit function. However, its long-term ability to pay all claims is free from the independent director decisions, the number of board meetings held annually, and the CEO's dual role of biasness. It also suggests that neither the size nor the age of the life insurer influences the solvency margin; rather, it depends on other factors like risk exposure, underwriting practices, and capital adequacy.

- H3: Corporate governance has significant impact on financial performance of non-life insurance industry.

Table 16

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615[a]	.378	.239	221.57793

a. Predictors: (Constant), FAGE, BS, CEOD, BM, ID, WD, ACS, FSIZE, BC
b. Dependent Variable: ROE
Source: Authors' analysis

Table 17

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1196012.281	9	132890.253	2.707	.015
	Residual	1963871.134	40	49096.778		
	Total	3159883.414	49			

a. Dependent Variable: ROE
b. Predictors: (Constant), FAGE, BS, CEOD, BM, ID, WD, ACS, FSIZE, BC
Source: Authors' calculation

Table 18

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1515.72	859.648		1.763	0.086
	BS	-57.448	16.479	-0.642	-3.486	0.001
	BM	-4.527	19.191	-0.04	-0.236	0.815
	BC	-16.176	37.309	-0.126	-0.434	0.667
	WD	16.159	38.014	0.073	0.425	0.673
	ID	34.458	25.895	0.244	1.331	0.191
	CEOD	-261.458	181.809	-0.204	-1.438	0.158
	ACS	17.656	21.2	0.184	0.833	0.410
	FS	102.286	56.466	0.507	1.811	0.078
	FA	-899.425	709.022	-0.5	-1.269	0.212

Dependent Variable: ROE
Source: Authors' compilation

Tables 16, 17 and 18 define the regression model summary to analyze the effect of corporate governance on ROE of the non-life insurance industry. The model summary table elaborates that only 37.8 percent of variation is explained by the explanatory variable. The p-value in the ANOVA table justifies that the model fit is insignificant. All the governance factors have no significant effect on ROE; only the BS has negatively influenced the financial measurement. That represents larger board size enhances the organizational conflict, slow decision making, weak collaboration network and also enhance the cost, all of which can reduce a firm's profitability and hence ROE.

However, Tables 19, 20 and 21 represent the model fit and regression summary to measure the effect of corporate governance facets on SM of non-life insurer business. The model is best fitted to explain the regression analysis because the p-value is 0.001, and we accept the alternative hypothesis that the model exists. Further, the model explains 48.5 percent variation of the SM by all explanatory variables. Further coefficient result in Table 21, signifies that SM is influenced by the BC & ID in board. By setting diversified board committees, non-life insurers better manage uncertain risk, enhance internal control, and increase strategic capital allocation, increasing the ability to meet long-term liabilities and improve solvency position. In addition, an independent director enhances the solvency position by taking independent decisions, reducing managerial opportunism, and better complying with strategic guidelines. All other governance facets and control variables have insignificantly influenced the SM of the non-life insurance industry.

Table 19

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697[a]	0.485	0.37	6.58096

a. Predictors: (Constant), FAGE, BS, CEOD, BM, ID, WD, ACS, FSIZE, BC

b. Dependent Variable: SM

Source: Authors' compilation

Table 20

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1633.872	9	181.541	4.192	.001[b]
	Residual	1732.361	40	43.309		
	Total	3366.233	49			

a. Dependent Variable: SM

Source: Authors' compilation

Table 21

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-7.62	25.532		-0.298	0.767
	BS	0.421	0.489	0.144	0.861	0.395
	BM	-0.537	0.57	-0.144	-0.943	0.351
	BC	-2.362	1.108	-0.564	-2.132	0.039
	WD	0.893	1.129	0.123	0.791	0.434
	ID	1.674	0.769	0.363	2.176	0.035
	CEOD	-0.098	5.4	-0.002	-0.018	0.986
	ACS	-0.893	0.63	-0.285	-1.418	0.164
	FS	1.416	1.677	0.215	0.845	0.403
	FA	10.599	21.058	0.181	0.503	0.618

a. Dependent Variable: SM

Source: Authors' compilation

7. CONCLUSION

This study explores a unique contribution in the governance literature and its effect on financial performance of both life & non-life insurance sector in India. Still, this subject area of research is unexplored and unfamiliar. Further, it also assesses the governance practices is similar or difference across the nature of insurer operations. The statistical relationships between the variables are measured through t-tests and multiple regression analysis. First, the empirical result reveals that there is no significant difference in corporate governance practices followed by the life and non-life insurance industries in India. In other words, it says that insurance firms are followed unique corporate governance practices irrespective to their nature of risk assurance. The reason behind this, both life and non-life insurers is regulated by the Insurance Regulatory and Development Authority of India (IRDAI). They have followed uniform governance standards i.e. Corporate Governance Guidelines 2024, covering ethical codes of conduct, internal control, mandatory board committees, and transparent policy should comply as per prescribe guidelines. Further, the primary objective of every insurer is to systematic managing unpredictable risk and shared stakeholder expectations, especially to protect the policyholder's interest. Hence, the similar nature of operations and common regulatory environment ensure a common governance framework in the Indian insurance context.

The inferential relationship between governance and financial performance are empirically examined. The board size has a negatively significant effect on ROE, which is confirmed in both life and non-life firms. This inference implies that the board composition with a certain limit is good for enhancing the financial return, but the extension from the standard limit is unsafe for shareholders return in the emerging Indian insurer market. So, board size inversely associates with ROE of insurance firms. However, other governance factors insignificantly influence the equity shareholders return in both life and non-life insurance businesses. It suggests that maybe the insurer governance system is more structured and standardized to follow strict regulations set up by the regulatory authorities. It is deprived that ROE of the insurance industry may be depends upon other factors such as capital structure, investment decisions, stock market operations, and different macroeconomic factors in the volatile economy. In the case of control variables, the market capitalization volume of the life insurer has a negative impact on ROE; in all other cases, it has been showing insignificant relations. However, SM of the life insurance industry is more dependent on governance indicators than the non-life insurance firms. Because SM of life insurers are significantly associated with board composition, board committees, board diversity, and independent audit functions. Hence, the financial stability and strength of the insurance industry to meet their expected claims are achievable through efficient board composition with independent decisions and effective formulation of an audit committee to oversee the financial record, internal control, and the importance of external audit affairs. Overall, the

result reveals that the financial performance of the insurance industry is shaped by the regulatory framework along with sustainable external market forces. As per statistical inference result, it concludes that the financial performance of both life and non-life insurers have barely affect through governance practices, but more significant effect on life insurers performance. The life insurance industry needs a more stringent governance mechanism than the non-life insurance industry due to its long-term contractual obligations, lump sum holding of policyholder funds, long-term investment model, and volatility of the external market environment.

Critically, the empirical results are partially articulated with selected corporate governance theories such as agency theory, institutional theory, and stewardship theory. Agency theory signifies that a larger board size causes organizational conflict and affects monitoring efficiency and thereby harms ROE. The limited influences of governance facets on financial performance align with institutional theory, that strict regulatory frameworks are not the only factor to optimize financial outcomes in the insurance business. The need for stronger governance in life insurance also resonates with stewardship theory, where effective board structures and committees enhance long-term stability. However, this study offers practical insight to policymakers and regulators by enabling sector-specific governance reforms, strategic risk management frameworks, enhanced disclosure norms, and promoting risk-based supervision in the volatile economy. Further, it helps government bodies and IRDAI to redesign guidelines for insurance business stability, integrity, and sustainability achievement.

8. LIMITATIONS AND FUTURE SCOPE OF THE STUDY

The study has certain limitations. Firstly, our study is based on selected corporate governance indicators, which may or may not generalize the overall implication of the topic. Hence, by adding more governance factors pertaining to committee and CEO facets in future research to produce more accurate results and theoretical application. Second, based on market capitalization, we selected the top five insurance companies from each sector. Specific future studies will incorporate more sample firms to optimize more credible results. In addition, future researchers also employ the panel estimator technique to address endogeneity issues and produce reliable output. The COVID-19 epidemic, however, has caused significant disparities in all financial sectors, particularly in the insurance industry, which is responsible for protecting human life and health. It would be interesting to examine the effect of corporate governance on the financial performance of the insurance industry across the globe during the Covid-19 pandemic period. It is an important note for consideration that our research findings are not undermined by these limitations. Rather, they open opportunities for the academician and researchers to explore and refine their understanding of the complex dynamics of the governance system and insurance landscape operations in the uncertain economy scenario.

Acknowledgment

The authors are thankful for the SRF scholarship support provided by UGC India for this study.

Author contributions

Bideharanjan Swain: Conceptualized the study contributed towards literature review, collection of data, data filtering and analysis, interpretation of results.

Sanjeeb Kumar Dey: Designed the methodology, supervised the data collection, corrected the final paper and revised the manuscript critically.

Disclosure statement

No potential competing interest to declare by the authors.

Funding

The author received no direct funding for this research.

Data availability statement

The data that support the findings of this study are available from the corresponding author, **Bideharanjan Swain** bideharanjan1998@gmail.com, upon reasonable request.

REFERENCES

Abdoush, T., Hussainey, K., & Albitar, K. (2022). Corporate governance and performance in the UK insurance industry pre, during and post the global financial crisis. *International Journal of Accounting & Information Management*, *30*(5), 617-640. https://doi.org/10.1108/IJAIM-03-2022-0049

Adams, M., & Jiang, W. (2020). Do financial experts on the board matter? An empirical test from the United Kingdom's non-life insurance industry. *Journal of Accounting, Auditing & Finance*, *35*(1), 168-195. https://doi.org/10.1177/0148558X17705201

Ajemunigbohun, S., Elegunde, A. F., & Azeez, F. T. (2020). Evaluation of corporate governance practices on financial performance of selected insurance firms in Nigeria. *Acta Universitatis Danubius. Œconomica*, *16*(4). CEEOL - Article Detail

Alhassan, A. L., Zyambo, K., & Afua Boakye, M. A. (2021). 'Welcome on board': resource dependency and agency theoretic evidence from the South African life insurance market. *Corporate Governance: The International Journal of Business in Society*, *21*(4), 626-644. https://doi.org/10.1108/CG-12-2019-0375

Anuolam, M. O., & Ajagu, C. (2022). The effect of corporate governance practices on life insurance penetration in Nigeria. *International Journal of Innovative and Advanced Studies*, *9*, 31-39. https://www.ijiras.com/2022/Vol_9-Issue_4/paper_5.pdf

Chakrabarti, R., & Megginson, W. I. (2009). Corporate governance in India. In *Global Corporate Governance* (pp. 151-176). Columbia University Press. https://doi.org/10.7312/chew14854-008

Chebotibin, M. (2022). *Effect of Corporate Governance on the Financial Perfomance of Insurance Companies in Kenya* (Doctoral dissertation, University of Nairobi). http://erepository.uonbi.ac.ke/handle/11295/163334

Dagunduro, M. E., Dada, S. A., & Asubiojo, A. O. (2023). Corporate governance, board attributes, and financial performance: A study of listed insurance companies in Nigeria. *Journal of Harbin Engineering University*, *44*(11), 1160-1170. https://harbinengineeringjournal.com/index.php/journal/article/view/2089

Dash, S. K., & Pany, T. K. (2013). Insurance industry in India-Prospects and challenges. *Asian Journal of Multidimensional Research (AJMR)*, *2*(4), 46-64. https://www.indianjournals.com/article/ajmr-2-4-005

Fadun, O. S. (2013). Corporate governance and insurance company growth: Challenges and opportunities. *International Journal of Academic Research in Economics and Management Sciences*, *2*(1), 286-305. https://www.researchgate.net/publication/348152060_Corporate_Governance_and_Insurance_Company_Growth_Challenges_and_Opportunities

Fatma, H., & Chouaibi, J. (2023). Corporate governance and firm value: a study on European financial institutions. *International Journal of Productivity and Performance Management*, *72*(5), 1392-1418. https://doi.org/10.1108/IJPPM-05-2021-0306

Goyal, B., & Gulati, R. (2024). Quality of financial reporting in the Indian insurance industry: Does corporate governance matter?. *Journal of Corporate Accounting & Finance*, *35*(4), 84-109. https://doi.org/10.1002/jcaf.22717

Goyal, B., & Gulati, R. (2025). A nexus between corporate governance and performance: Evidence from the Indian insurance industry. *International Journal of Disclosure and Governance*, 1-27. https://doi.org/10.1057/s41310-024-00283-y

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123. https://www.researchgate.net/publication/320706302_PLS-SEM_or_CB-SEM_updated_guidelines_on_which_method_to_use

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long range planning*, *46*(1-2), 1-12. https://doi.org/10.1016/j.lrp.2013.01.001

Handley-Schachler, M., Juleff, L., & Paton, C. (2007). Corporate governance in the financial services sector. *Corporate Governance: The international journal of business in society*, *7*(5), 623-634. https://doi.org/10.1108/14720700710827202

Kalia, A., & Gill, S. (2023). Corporate governance and risk management: a systematic review and synthesis for future research. *Journal of advances in management research*, *20*(3), 409-461. https://doi.org/10.1108/JAMR-07-2022-0151

Kelly, S. J., Derrington, S., & Star, S. (2022). Governance challenges in esports: a best practice framework for addressing integrity and wellbeing issues. *International Journal of Sport Policy and Politics*, *14*(1), 151-168. https://doi.org/10.1080/19406940.2021.1976812

Klettner, A. (2021). Stewardship codes and the role of institutional investors in corporate governance: An international comparison and typology. *British Journal of Management*, *32*(4), 988-1006. https://doi.org/10.1111/1467-8551.12466

Krishnamurthy, S., Mony, S. V., Jhaveri, N., Bakhshi, S., Bhat, R., Dixit, M. R., ... & Bhat, R. (2005). Insurance industry in India: structure, performance, and future challenges. *Vikalpa*, *30*(3), 93-120. https://doi.org/10.1177/0256090920050308

Magee, S., C. Schilling, and E. Sheedy. 2019. Risk governance in the insurance sector—determinants and consequences in an international sample. Journal of Risk and Insurance 86(2): 381–413. https://doi.org/10.1111/jori.12218

Maharjan, R. (2019). Corporate governance and financial performance of insurance companies in Nepal. *The International Research Journal of Management Science*, *4*, 99-117. https://doi.org/10.3126/irjms.v4i0.27888

Martínez-Ferrero, J., & García-Sánchez, I. M. (2017). Sustainability assurance and assurance providers: Corporate governance determinants in stakeholder-oriented countries. *Journal of Management & Organization*, *23*(5), 647-670. https://doi.org/10.1017/jmo.2016.65

Ramadhan, E. M. R., Wijaya, M. B. L., & Ruslan, B. (2022). Corporate governance and principal-agent theory: A critical review. *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi Dan Bisnis*, *10*(2), 1391-1404. https://doi.org/10.37676/ekombis.v10i2.2108

Satish, K. (2019). The Dynamics of General Insurance Sector in India-Growth and Performance Perspective. *International Journal of Engineering and Advanced Technology (IJEAT)*, *9*(2), 536-540. https://doi.org/ 10.35940/ijeat.B3261.129219

Tackie, G., Agyei, S. K., Bawuah, I., Adela, V., & Bossman, A. (2022). Tax planning and financial performance of insurance companies in Ghana: the moderating role of corporate governance. *Cogent Business & Management*, *9*(1), 1-18. https://doi.org/10.1080/23311975.2022.2144097

Yap, S., Lee, H., & Liew, P. X. (2025). How do Life and Non-Life Insurance Affect Financial Inclusion? New Empirical Evidence from a Cross-Country Analysis. *Bulletin of Monetary Economics and Banking*, *28*(1), 117-144. https://doi.org/10.59091/2460-9196.1977

Yensu, J., Osei, Y., & Atuilik, D. A. (2017). Corporate Governance Structure and Insurance Companies' Performance in Ghana. *Corporate Governance*, *8*(4), 32-48. https://www.iiste.org/Journals/index.php/RJFA/article/view/35702/36710

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THEORY METHODOLOGY PRACTICE | Review of Business and Management
2025 VOLUME 21 NUMBER 2
https://doi.org/10.18096/TMP.2025.02.05

Navigating Adoption of Financial Derivatives: Dynamics of Complexity and Regulatory System

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SUMMARY

This study examines the intention of financial institutions to adopt financial derivatives in less developed markets. Integrating key innovation attributes, complexity and regulatory system as a moderator. The theoretical framework uses complexity theory and financial innovation theory to provide a robust explanation of adoption behaviour. Data were collected from 142 financial institutions in Tanzania. Using Structural Equation Modelling (SEM).

The results demonstrate that complexity and the responsive regulatory system significantly influence the intention to adopt financial derivatives, and the regulatory system significantly moderated the adverse effect of complexity. Theoretically, this study contributes to the financial innovation literature by integrating complexity theory in adoption models, offering empirical validation in a developing market context. These findings provide practical insights for derivative designers, financial educators, and regulatory authorities.

HOW TO CITE:
Tunze, R., Richard, E., & Mkwizu, E., (2025). Navigating adoption of financial derivatives: dynamics of complexity and regulatory system THEORY METHODOLOGY PRACTICE: Review of Business and Management, 21(2), 62-76. https://doi.org/10.18096/TMP.2025.02.05

ARTICLE HISTORY
Received 13 September 2025
Revised 06 October 2025
Accepted 20 December 2025
Published 30 December 2025

KEYWORDS
Complexity, regulatory system, adoption intention, financial derivatives

JEL CLASSIFICATION
G180

1. INTRODUCTION

Financial derivatives have developed into an important innovation within the contemporary economic landscape. As of 2023, the notional value of global derivatives markets surpasses $600 trillion, highlighting their pivotal role in modern financial intermediation (BIS, 2023). Derivatives significantly improve market liquidity, optimise capital efficiency, and facilitate risk distribution, thereby fostering more dynamic and adaptable financial systems. The growing prevalence of unconventional financial structures such as credit-linked notes, synthetic securitisation, and tailored swap agreements has concurrently introduced considerable complexity (Rahman, 2015). Studies show that innovator use complexity as strategic asset that gives them monopoly rent for their innovations. To others, the complexity involved has created challenging for institutions to evaluate risks precisely (Fabozzi, 2025).

The complex innovative derivatives operating in complex financial markets create a complex financial system (Wang et al., 2020). Many regard it as an impediment to entry; organisations may exhibit reluctance in embracing complex derivatives (Schammo, 2021). This happens especially when their internal capabilities and oversight frameworks are insufficient (Al Janabi, 2024). The complexity of this challenge is further exacerbated by the entrenched nature and inflexibility of conventional regulatory frameworks (Battiston, Farmer, et al., 2016). Throughout history, the realm of regulation has often found itself lagging behind the rapid advancements in financial innovation. Silber (1975) and Financial Innovation Theory (1983) showed the link between financial innovation and regulatory systems.

The 2008 Global Financial Crisis revealed the profound inadequacies in the regulation of Over the Counter (OTC) derivatives as opposed to Derivative exchange platform derivatives. The OTC derivative, particularly credit default swaps,

and their potential to exacerbate systemic shocks (Zakheos, 2022). In the aftermath of the crisis, there was an avalanche of regulations from Basel III requirements to Dodd-Frank in 2010 (Yazlyuk et al., 2018). However, disjointed supervision, transnational regulatory exploitation, and unclear definitions continue to exist, especially in developing markets where regulatory capabilities and technological frameworks are constrained (Jarvis, 2017).

One of the effective regulatory systems is a responsive regulatory system. It highlights the importance of graduated enforcement (Braithwaite, 2011), behavioural monitoring, and real-time data analytics as essential instruments for enhanced oversight (Arner et al., 2016). It operates as a pyramid structure where, at the lowest level, knowledge, support, and clarity are based. At the high level, a few non-compliant investors are being punished. Instead of perceiving regulations as an external limitation, this perspective positions regulatory responsiveness as a strategic facilitator—one that influences whether complexity acts as an obstacle or a driving force for institutional innovation, hence moderating the effect of complexity.

Previous studies have shown the relationship between complexity and its influence on adoption in various contexts, such as financial derivatives and non-financial derivatives. These studies found the negative influence on the complexity in reporting of financial derivatives. Regulatory system effectiveness influence has also been investigated with different results (Bag et al., 2023; Schaupp et al., 2022; Allen, 2019) and the responsiveness of the regulatory system was not examined while it influences the financial system. Therefore, there remains a significant gap in understanding how regulatory responsiveness could moderate the influence of the relationship between complexity and adoption intention, which this study aimed to fill.

Accordingly, the implications of the above work are multiple. Besides the extensive studies on the financial derivative complexity, it also fills the empirical gap specifically on the responsive regulatory system. Second, it enhances the theoretical gap by synthesising Silber's Financial Innovation Theory with Complexity Theory. Third, our research offers practical insights for regulators and policymakers, highlighting the importance of responsiveness in the regulatory system for developing financial derivatives markets. This has effects for both developed and developing financial markets. The rest of the paper is section as follows, theoretical and empirical reviews, methodology, findings and discussion, conclusion and recommendations.

2. LITERATURE REVIEWS

2.1. Theoretical Literature Reviews

This research is based on two complementary theoretical perspectives: financial innovation theory and complexity theory. These perspectives offer a strong foundation for comprehending the relationship between the complexity of financial instruments, the intentions of institutional adoption, and the responsiveness of regulatory mechanisms. The combination informs the central proposition of this study of these theories: the responsiveness of the regulatory environment is a determining factor in the relationship between derivative complexity and institutional adoption intentions. In highly responsive systems, complexity may be perceived as manageable and value-generating.

Complexity Theory, which has its roots in systems science (Simon, 2012), in the context of financial innovation, complexity is defined as the structural opacity, multivariate risk profiles, Valuation challenges and information asymmetries (Turner & Baker, 2019). In financial markets, the diffusion of highly customised derivatives (especially in OTC environments) amplifies institutional uncertainty and implementation barriers — particularly for entities lacking analytical capacity (Battiston, Caldarelli, et al., 2016). Therefore, complexity may act as a barrier rather than a strategic advantage in such settings. Complexity Theory thereby elucidates the nonlinear connection between institutional adoption and innovation sophistication, particularly in environments with restricted analytical or regulatory capabilities (Gai et al., 2011).

In addition, Financial Innovation Theory Silber (1975) conceptualises innovation as a mechanism by which financial institutions respond to and surmount constraints, including regulatory, institutional, and economic ones. This logic is exemplified by derivatives, which allow firms to circumvent capital controls, manage illiquid exposures, or customise risk-transfer solutions. Innovations like swaps or credit derivatives historically emerged to evade capital controls, enable bespoke risk-sharing, and adapt to institutional constraints. However, FIT also highlights a paradox: as institutions innovate to bypass barriers, they often create new regulatory gaps and systemic risks. In this sense, regulatory friction both stimulates innovation and requires adaptive oversight (Frame & White, 2014). Consequently, Financial Innovation Theory offers a framework for comprehending the reasons why institutions pursue complexity in financial innovations.

Both theories communicate to explain adoption intentions, while Financial Innovation Theory FIT explains *why* institutions seek innovation (even complex ones), and CT explains *why* they may hesitate to adopt them. These theories converge on the idea that responsive regulation can bridge this gap by reducing institutional uncertainty.

2.2. Empirical Literature Reviews

To ensure conceptual clarity, this literature review includes core studies that focus directly on financial derivative adoption, especially in emerging markets; Adjacent literature explores financial technologies (FinTech) that share institutional and regulatory dynamics with derivatives; Peripheral research covers broader innovation adoption contexts, offering pattern-based insights rather than direct causality.

2.2.1. Influence of complexity on the adoption intention of financial derivatives

Complexity is the perceived difficulty of understanding, using, or implementing an innovation (Rogers, 2003). The relationship between complexity and adoption intention has been widely examined across product categories. In derivatives, complexity manifests through: tailor-made financial engineered Over The Counter OTC structures, which implies that financial derivative trading platforms also have room for complexity. In the other platform, Organised Derivative Exchanges ODE financial derivatives are standardised (Lewandowska, 2020). The complexity of financial derivatives is the result of tailored solutions specific to the needs of clients, but can also cause ambiguity, valuation challenges, accounting friction, and behavioural hesitation, discouraging the adoption, particularly for institutions with limited analytical or regulatory capacity (Hirsa, 2024). Furthermore, network complexity results from institutions establishing multilayer financial networks, increasing contagion risk where one institution's default becomes a challenge to the system (Battiston, Caldarelli, et al., 2016).

Complexity is increasingly seen as a key factor in the adoption of financial derivatives (Verma, 2024) — a challenge in Accounting and reporting (Malaquias & Zambra, 2020). With numerous reporting requirements discouraging derivative adoption (Gope, 2017; Gope & Mitra, 2018; Hairston et al., 2019; Hairston et al., 2023; Malaquias & Zambra, 2020; Tunze et al., 2025). Furthermore, Complexity inhibits adoption across financial and technological domains from cloud systems to big data (Albayati et al., 2020; Sun et al., 2021), Institutions with limited technical/regulatory capacity are disproportionately affected (Gope, 2017; Hairston et al., 2023). While some exceptions exist Al-Okaily et al. (2024) , the consensus supports that increased complexity leads to reduced adoption intent.

Therefore, from the complexity theory and previous literature, the study postulates that:

H1: Complexity has a significant negative influence on the intention to adopt financial derivatives.

2.2.2. Influence of Responsive Regulatory System on the adoption intention of financial derivatives

Financial innovation theory posits that regulatory systems function as critical external catalysts that either facilitate or hinder financial innovation (Silber, 1983). The structure of regulatory systems impacts adoption intentions directly through their structural design (Drahos, 2017). The regulatory system is defined as a combination of institutions, laws, and processes that give a government control over the operating and investment decisions. Thus, it comprises regulations, regulators and regulated persons. Regulation establishes boundaries for the conduct of participants in financial markets to safeguard against socially harmful outcomes (Barak-Corren & Kariv-Teitelbaum, 2021).

Globally, financial derivatives markets are shaped by transnational regulatory regimes led by bodies such as the Basel Committee on Banking Supervision, the International Organisation of Securities Commissions (IOSCO), and the Financial Stability Board (FSB) (Donnelly, 2019). These institutions have coordinated post-crisis regulatory reforms aimed at enhancing transparency, mandating central clearing for standardised OTC contracts, and improving counterparty risk management (Servais, 2020). The evolving characteristics of financial derivatives necessitate adaptive, responsive regulation that fosters innovation while preventing their systemic risks (Awrey, 2015). Therefore, responsive regulatory systems that are acknowledged for their dynamic and flexible enforcement strategies become paramount (Braithwaite, 2016).

Financial Innovation Theory positions the regulatory system in the aspect of regulation as a key environmental factor that constrains innovation via compliance burdens, or enables adoption via safety nets and trust-building (Silber, 1983; Barak-Corren & Kariv-Teitelbaum, 2021). Uncoordinated frameworks promote arbitrage (Henkel, 2019), but responsive models (like sandboxes and graduated enforcement) promote safe experimentation (Braithwaite, 2016). In developing markets, fragmented oversight and limited capacity hinder uptake (Jarvis, 2017; Хоменко et al., 2024; Njoroge et al., 2013). Nevertheless, innovations like central counterparties (CCPs) demonstrate how regulation can reduce risk perception and enhance trust (Chance, 2017; Thomadakis & Lannoo, 2021).

While complexity typically deters adoption, regulatory responsiveness can reduce this negative effect. Responsive regulation includes: Real-time monitoring (Arner et al., 2016), behavioural insights (Barak-Corren & Kariv-Teitelbaum, 2021), dynamic enforcement hierarchies (Braithwaite, 2011). Such frameworks build institutional trust, offering interpretive flexibility that offsets perceived complexity. (Ranchordas & Vinci, 2024)

Research in fintech adoption supports this moderating role — where adaptive policy design improved adoption in sectors like food safety, AI, and green finance (Fernando et al., 2015; Li et al., 2019; Ullah et al., 2024).

The critical role of responsive regulatory regimes is to moderate the perceived complexity of financial derivatives by acting as interventions. There are many interventions after a crisis, such as the establishment of Central Counterparties (CCPs). CCP introduction used to mitigate counterparty risk, and the contagion results through centralised netting (Chance, 2017). Thomadakis and Lannoo (2021) show that Central Counterparties (CCPs) have facilitated the heightened usage of derivatives, also evidenced by Bank for International Settlements (BIS) data.

Previous studies on the influence of the regulatory system on adoption and complexity have been positive and negative for others. Hee and Song (2017) discovered that both regulatory frameworks in Korean insurance companies have a positive influence on adoption. Conversely, Thinh et al. (2020) recognised legal ambiguities as impediments to adoption in Vietnam, paralleling the conclusions of Al-Slehat et al. (2018) in Jordan and Bhadra and Singh (2024) in India, where regulatory friction and taxation deterred derivative use. Similarly, China (Hao et al., 2022) shows the same results. Emerging markets encounter distinct challenges that have hindered the adoption of derivatives (Хоменко et al., 2024; Kobilarev & Živanović, 2019). Njoroge et al. (2013) highlighted that Kenya's disjointed regulatory framework hindered market efficiency and the advancement of intermediaries. The clarity and scale of regulations were crucial for enterprises' engagement with complicated derivatives.

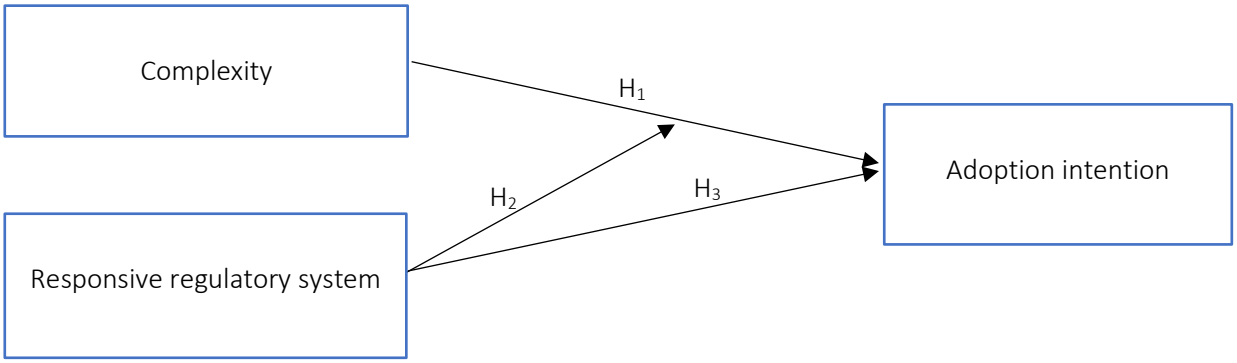
From Financial Innovation Theory (Silber, 1975), firms innovate to bypass regulatory barriers but may delay adoption if regulatory frameworks are rigid (Awrey & Macey, 2022). Responsive regulation reduces information asymmetry and institutional uncertainty (Braithwaite, 2011)

Therefore, this study proposed that:

H2: Responsive Regulatory System positively influences the adoption intention of financial derivatives

H3: A Responsive Regulatory system moderates the influence of complexity on Adoption Intention

The proposed framework is graphically presented in Figure 1.



Source: Literature review

Figure 1: The conceptual framework of the adoption intention of financial derivatives

3. METHODOLOGY

3.1. Research Methods and Population

A quantitative research design was utilised to empirically investigate the moderating effect of responsive regulatory regimes on the link between the complexity of financial derivatives and institutional adoption intention. This method was chosen for its effectiveness in objectively analysing structured data and detecting statistically significant correlations among latent dimensions (King et al., 2021). Primary data were obtained using a standardised questionnaire addressed to senior executives of financial institutions in Tanzania. The unit of analysis was financial institutions. The target respondents or unit of inquiry were finance and risk management department heads, recognised as pivotal decision-makers having a direct impact on the institutional and department adoption of financial derivatives. These persons generally possess the

strategic authority to analyse derivative instruments, analyse regulatory restrictions, and promote their adoption at the board level (Lien, 2022). The research population comprised departments in commercial banks, insurance firms, pension funds, and mutual funds, predominantly located in Dar es Salaam and Dodoma, where the density of regulated financial institutions is highest. A sampling of 158 intended participants. A total of 142 completed replies were received, resulting in an 89.8% response rate, adequate for subsequent statistical analysis employing Structural Equation Modelling (Hair et al., 2021).

3.2. Data Collection Instrument

The questionnaire was modified from recognised, published sources in order to guarantee content validity and coherence with the study's conceptual framework. Items were adjusted according to expert recommendations (Amirzadeh et al., 2024). All constructs were assessed using a five-point Likert scale, from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). The survey tool encompassed the complexity constructs, which is the extent to which financial derivatives are regarded as technically or operationally challenging to implement. Measurement items were sourced from Davis (1989) and Rogers (2003), encompassing factors such as reporting difficulty, usage difficulty, and learning duration. Responsive Regulatory System (Moderator): Derived by modifying indicators from Braithwaite, (2016) and Drahos, (2017), containing elements of the regulatory pyramid. This encompasses the clarity of regulation, knowledge, complexity, changes needed, and Adoption Intention: Metrics were derived from Teo et al. (2003), Davis et al. (1989), encompassing adoption planning, recommendation willingness, risk-benefit assessment, and preference for alternative tools.

3.3. Data Analysis Method

The gathered data were examined via Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS 4. This method was selected for its appropriateness in models that incorporate both reflecting constructs and moderating effects. It enables concurrent estimation of measurement and structural models, facilitating rigorous route coefficient analysis and hypothesis testing (Hair et al., 2021). The model underwent evaluation for reliability, convergent validity (utilising Average Variance Extracted and factor loadings), and discriminant validity (via Fornell-Larcker and HTMT criteria). The moderating influence of the responsive regulatory system on the complexity–adoption link was evaluated using an interaction term approach, assessing if the intensity and direction of this relationship varied significantly across different levels of regulatory responsiveness.

4. RESEARCH FINDINGS

4.1. Analysis of Respondents

This study examined the distribution of respondents amongst various types of financial institutions—banks, insurance firms, pension funds, and mutual funds—to ensure a comprehensive grasp of institutional viewpoints. The categories were chosen due to their strategic significance in financial markets and their differing exposure to derivative instruments (Kidwell et al., 2016). A total of 142 respondents provided data. Banks were the predominant portion, with 60.6% of the sample. Insurance firms constituted 35.2% of the total respondents. The residual segment of the sample comprised pension funds and mutual funds, together representing 4.2%. This distribution illustrates the paramount influence of commercial banks and insurance companies on Tanzania's financial markets.

4.2. Descriptive Analysis of Constructs Using SPSS

The study explores the means, standard deviations, skewness, and kurtosis of the constructs studied, and a descriptive statistical analysis was performed. The results for all constructs are shown in Table 1. In general, the mean of constructs reflected the level of respondents' perceptions of the construct.

Table 1

Descriptive analysis of constructs using SPSS

Constructs	Mean	Std. Deviation	Skewness	Kurtosis
Complexity	3.2312	0.74426	0.185	-0.982
Responsive Regulatory System	4.135	0.43122	-0.358	-0.67
Adoption Intention	3.9915	0.58872	0.159	-1.315
Average	3.78	0.58		

Source: Smart PLS

Descriptive statistics illustrate institutional views on financial derivative usage, complexity, and regulatory system. Complexity scores averaged 3.23 (SD = 0.74), indicating significant difficulty using financial derivatives. The positive skewness of 0.185 shows that a minority of respondents thought derivatives were more complex than average, reflecting financial sophistication or institutional capabilities. A flatter distribution with a negative kurtosis of -0.982 suggests institutional complexity varies.

Responsive Regulatory system scores averaged 4.14 (SD = 0.43), showing institutional confidence in the regulatory system. The negative skewness of-0.358 indicates that most respondents rated the regulatory system positively, while the negative kurtosis of-0.670 indicates an even distribution around the mean. The findings indicate that respondents saw the regulatory system as helpful and responsive, which may boost institutions' willingness to offer financial products. Institutions were likely to implement financial derivatives, as the mean adoption intention was 3.99 (SD = 0.59). A little positive skew of 0.159 shows stronger adoption readiness, while a negative kurtosis of-1.315 predicts a wider response dispersion.

4.3. Measurement Model Assessment with Smart PLS4

To assess the measurement model's reliability and validity for the constructs, various test was done, such as indicator reliability, internal consistency reliability, convergent validity, and discriminant validity using Smart PLS 4. The results show that the model passed all the specified psychometric standards. Item loadings exceeded the minimum threshold of 0.50, ranging from 0.696 to 0.908; the item that had a lower loading was eliminated, indicating that each remaining observed indicator makes a significant contribution to its corresponding latent construct. Internal consistency reliability was determined using composite reliability (CR) values ranging from 0.841 to 0.939 and Cronbach's alpha scores ranging from 0.754 to 0.918. The middle Rho values range from 0.764 to 0.920. Both outperform the suggested cut-off values, indicating good internal consistency and reliable construct measurements.

Convergent validity was further supported by the average variance extracted (AVE) values for all constructs, which were above the 0.50 threshold, showing that each construct explains a significant percentage of the variance in its indicators. Discriminant validity was proven using several criteria. First, the Fornell-Larcker condition was met because the square root of each construct's AVE outperformed its correlations with other constructs. Second, the heterotrait-monotrait ratio (HTMT) values were all less than the conservative threshold of 0.85, indicating that the conceptions are conceptual and statistically distinct. Furthermore, cross-loading analysis demonstrated that each item loaded more strongly on its assigned concept than on other constructs, hence supporting discriminant validity. Table 2 presents a condensed overview of the measurement model data, as well as a graphical depiction of the measurement model to aid interpretation. Figure 2 shows pictorial presentation of the measurement model assessment.

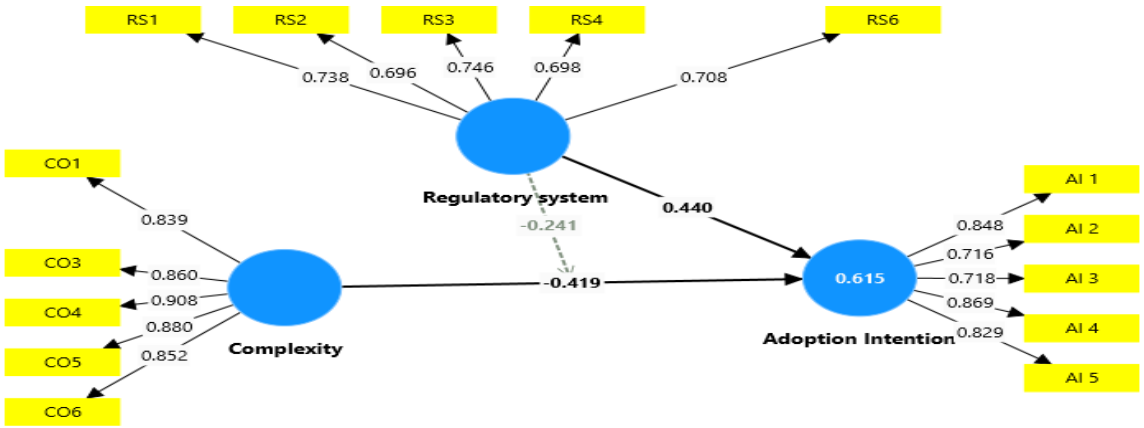
Table 2

Measurement Model Assessment

Constructs	Indicators	Reliability			Validity		
		IR	ICR			CV	DV
		Loadings	CR α	ρ_a	ρ_c	AVE	HTMT
		> 0.5	> 0.7	CRα > 0.7 < ρ_c	> 0.7	> 0.5	< 0.85
Complexity	CO1	0.839	0.918	0.92	0.939	0.754	0.658
	CO3	0.860					
	CO4	0.908					
	CO5	0.880					
	CO6	0.852					
Responsive Regulatory system	RS1	0.738	0.751	0.752	0.834	0.514	0.737
	RS2	0.696					
	RS3	0.746					
	RS4	0.698					
	RS6	0.708					
Adoption Intention	AI1	0.847	0.857	0.87	0.897	0.638	
	AI2	0.722					
	AI3	0.717					
	AI4	0.869					
	AI5	0.826					

Source. Smart PLS

Overall, the results show that the measurement model has high psychometric qualities, including indicator reliability, internal consistency, convergent validity, and discriminant validity.



Source: Smart PLS4 (2025)

Figure 2: Measurement Model

4.4. Structural Model Assessments with Smart PLS 4

Following a successful review of the measurement model, the assessment of the structural model evaluated the relationships between constructs. Assessing collinearity statistics (VIF), path coefficients (β), coefficient for

determinations(r^2), effect sizes (f^2), t-statistics, and p-values is essential for determining the strength, significance, and practical relevance of proposed correlations. Non-parametric bootstrapping with 5,000 subsamples was employed to estimate path coefficients, as recommended in PLS-SEM due to its robust inference capabilities and absence of normality assumptions. Based on the directed study hypotheses, which posit that regulatory systems positively influence adoption intention while complexity negatively impacts it, one-tailed hypothesis testing was employed. One-tailed tests enhance statistical power when the direction of the association is hypothesised.

4.4.1. Variance Inflation Factor (VIF)

Variance Inflation Factor (VIF) is used to assess the level of multicollinearity in a model (Hair et al., 2021). Multicollinearity arises when independent variables are highly correlated, distorting coefficient estimates and reducing the model's interpretability. The criterion of the VIF value is VIF ≤ 3.3. the no collinearity problem (Kock, 2015). In this study, as per Table 3, all VIF values are less than 3, indicating that there is no substantial multicollinearity among the independent variables(Hair et al., 2021). The greatest VIF is for regulatory system 1.855, which is still well within safe limits.

4.4.2. Path coefficient, F-squared, T statistic and P value

Other structural model findings in terms of the proposed hypothesis are shown in the table. The first hypothesis (H1), which investigated the influence of Complexity on Adoption Intention, was validated. The path coefficient was negative and statistically significant (β =-0.419, t = 7.075, p < 0.001), indicating that increased perceived complexity diminishes the propensity to embrace financial derivatives. The effect size magnitude was moderate (f^2 = 0.322), affirming its practical significance.

The second hypothesis (H2), which evaluated the impact of the Regulatory System on Adoption Intention, was also substantiated. The findings indicated a positive and substantial correlation (β = 0.440, t = 6.989, p < 0.001), illustrating that strong regulatory frameworks enhance adoption intention. The effect size was moderate (f^2 = 0.352), underscoring the significance of institutional contexts in influencing adoption behaviour.

Table 3

Summary of Structural Model Assessments

Hypothesis Relationship	VIF	F-square	Path coefficient	T statistic	P values	Significant	Negative/ Positive
H1: Complexity -> Adoption Intention	1.418	0.322	-0.419	7.075	0.000	Yes	Negative
H2: Regulatory system -> Adoption Intention	1.430	0.352	0.440	6.989	0.000	Yes	Positive
H3: Regulatory system x Complexity -> Adoption Intention	1.012	0.081	-0.241	3.488	0.000	Yes	Negative

Source: Smart-PLS4 (2025).

The third hypothesis (H3) assessed the moderating influence of the Regulatory System on the link between Complexity and Adoption Intention. The interaction term was significant (β =-0.241, t = 3.488, p < 0.001) with a small to moderate effect size (f^2 = 0.081). This suggests that a robust regulatory framework alleviates the adverse effects of complexity, therefore promoting adoption despite perceived obstacles. The study model accounted for 61.5% of the variation (R^2 = 0.615) in Adoption Intention, indicating significant explanatory strength and highlighting the framework's robustness.

4.4.3. Moderation Analysis of Regulatory System

Complexity demonstrated a notable negative impact on adoption intention (β =-0.408, t = 6.771, p < 0.001; f^2 = 0.283), suggesting that increased perceived complexity diminishes individuals' readiness or capacity to adopt new systems. The introduction of the moderator (interaction term) Regulatory System resulted in an increase in the model's explanatory power from R^2 = 0.584 to R^2 = 0.615, indicating an additional 3.1% variance in adoption intention. The interaction effect demonstrated statistical significance (β =-0.241, t = 3.488, p < 0.001) and practical relevance (f^2 = 0.081), albeit with a

smaller effect size compared to the direct effects. This negative interaction indicates that the beneficial impact of a supportive regulatory environment diminishes in contexts characterised by high complexity.

Table 4a

Before Moderation

Relationships	VIF	Path coefficient	f-square	T statistics	P values
Complexity -> Adoption Intention	1.414	-0.408	0.283	6.771	0.001
Regulatory system -> Adoption Intention	1.414	0.463	0.364	7.605	0.001

Source. Smart PLS4

Table 4b

After Moderations

	VIF	Path coefficient	F-square	T statistics	P values
Regulatory system x Complexity -> Adoption Intention	1.012	-0.241	0.081	3.488	0.001

Source. Smart PLS4

Table 4c

Coefficient for determinations (R-square)

Adoption Intentions	R^2
Before Moderation	0.584
After Moderations	0.615

Source. Smart PLS4

The comparison of models pre- and post-moderation from Table 4a and Table 4b demonstrates that regulation serves as an effective mechanism for promoting adoption, though its impact is not definitive. The effectiveness is influenced by the level of complexity, which may either enhance or diminish it. These insights are crucial for policy design in developing countries, where regulatory structures and implemented systems frequently demonstrate significant complexity. Developing straightforward, clear, and contextually relevant regulations is essential for maintaining elevated adoption rates in these environments. Moreover, Prior to moderation, the R^2 as on Table 4c score was 0.584, (58.4%) of the variance in adoption intention. Post-moderation, the R^2 ascended to 0.615, (61.5%) of the variation. The 3.1% increase indicates that the moderator(s) introduced significant interaction effects that improve the model's predictive ability.

5. DISCUSSION OF THE FINDINGS

The main objective of this study is to examine the influence of complexity and the responsive regulatory system on adoption intentions. Moreover, the study aims at to examine the moderating influence of the responsive regulatory system. These objectives were transformed into hypotheses, and they were tested statistically using PLS SEM with smart PLS as a data analysis tool. The study tested the relationship between complexity and the regulatory system with adoption intentions. Also, the study tested the moderating effect of the regulatory system on the relationship between the complexity of and adoption intentions of financial derivatives.

The examination of the relationship indicates that complexity has a substantial adverse effect on adoption intention (β =-0.408, t = 6.771, p = 0.001;<0.05). This suggests that as derivatives become increasingly complex, the likelihood of investor adoption diminishes. The significant adverse effect of complexity on adoption intention highlights a broader systemic issue: in underdeveloped financial ecosystems, complexity represents technical difficulty and institutional fragility. This finding validates the Complexity Theory (Turner & Baker, 2019), also corroborates previous research

indicating that financial products characterised by high complexity impede diffusion adoption (Wang et al., 2016; Chen et al., 2021). The result closely reflects the concerns raised by Chiu (2023) when linking complexity, regulation and the financial market.

In contrast, the regulatory variable exhibited a substantial positive impact on adoption intention (β = 0.463, t = 7.605, p = 0.001;<0.05). This indicates that a well-organised and responsive regulatory framework fosters adoption by instilling confidence in market actors. The positive relationship affirms key propositions in the Responsive regulatory strategy literature. In contexts where regulation is perceived as adaptive, participatory, and risk-sensitive, institutions gain confidence to engage with complex financial instruments. This study's findings suggest that responsive regulatory environments act as institutional enablers, reducing perceived uncertainty and enhancing interpretive clarity. Similarly, Chiu (2023) argue that adaptive regulation, particularly through sandbox frameworks and iterative rule-making, improves innovation adoption by reducing institutional uncertainty and compliance risk. The outcome aligns with findings from Hee and Song (2017), which highlight the facilitative function of regulation in promoting financial innovation. However, opposing results on Thinh et al. (2020), Al-Slehat et al. (2018) and Bhadra and Singh (2024) in India, Hao et al. (2022) , Хоменко et al.(2024); Kobilarev and Živanović (2019) and Njoroge et al. (2013). Where they show the negative influence of the regulatory system.

The incorporation of the responsive regulatory system's moderating influence greatly enhanced the model. The interaction between responsive regulatory systems and complexity was statistically significant (β =-0.241, t = 3.488, p < 0.001), This corresponds with previous studies Fernando et al., (2015), Ngisau & Ibrahim, (2020), Li et al., (2019), Ullah et al., (2024) and the responsive regulatory system. There is a decrease in the negative effect of complexity from-0.408 to-0.241, suggesting that the responsive regulatory systems mitigate the adverse influence of complexity on adoption intention but do not eliminate all the adverse influence. This suggests many reasons, such as the speed of complexity that results from more innovative financial derivatives that goes higher compared to the knowledge of the regulator, that was explained in regulatory dialectic theory. Regulatory system in this context functions as a partial buffer, creating room for experimentation.

The result also directly supports Chiu (2023), who caution on responsive regulation in the absence of organisational preparedness. Adoption decisions remain bounded by knowledge, risk aversion, and capacity limitations. This interaction pattern underlines the importance of pairing responsive regulation with capacity-building measures, such as training, decision-support tools, and tailored compliance pathways. This pattern resonates with Awrey's (2015) claim that financial innovation often outpaces interpretive capacity, making adoption difficult even when regulation is enabling. Complexity operates at multiple levels—technical, cognitive, and institutional (Poutanen et al., 2016). As Braithwaite (2011) emphasises, responsive regulation must be dialogic and continuous to build compliance capacity. In summary, while complexity hinders adoption, a robust regulatory framework mitigates this negative impact, facilitating acceptance even in challenging product situations.

The model's explanatory power was enhanced following the inclusion of the moderator. Before moderation, the model accounted for 58.4% (R^2 = 0.584) of the variance in adoption intention. Upon incorporating the moderating impact, the explained variation rose to 61.5% (R^2 = 0.615). This enhancement illustrates that the regulatory framework is essential in augmenting the model's prediction precision by mitigating the adverse effects of complexity while bolstering the beneficial impact of regulation. The findings indicate that clear, accessible, and user-oriented regulations can minimise complexity, enhance trust, and promote adoption, even in systems regarded as difficult. The findings empirically support the notion that responsive regulatory frameworks enhance adoption directly and diminish the perceived burden of complexity, thereby rendering complex systems more approachable and adoptable.

6. CONCLUSIONS

A progressive, prudential, and risk-sensitive regulatory framework is needed to develop derivatives in developing markets like Tanzania. Clear eligibility rules and asset allocation constraints for institutional participants like banks, pension funds, and insurance corporations are needed to restrain speculative excesses in shallow and growing markets. These policies should provide enough flexibility for appropriate hedging and long-term investments that build the real sector. Developing markets may aggressively attract qualified domestic institutional investors to increase participation and market breadth. We must carefully sequence this growth, backed by compliance readiness evaluations and capacity-building initiatives, to guarantee good governance and informed risk management for all participants. Tanzania must also foresee and overcome regulatory obstacles, notably supervisory capacity, learning from developed financial markets. To manage a developing and complicated market, the Capital Markets and Securities Authority (CMSA) needs specialised training, derivatives expertise, and regulatory technology.

For high-leverage participants like hedge funds and international institutional investors, market liberalisation must be staged carefully. Developing markets like Tanzania must have strong macroprudential controls, including capital adequacy, exposure limitations, and stress-testing procedures, before allowing these actors. With enhanced market transparency

and accountability, Tanzania could reconsider investing limitations on collective investment schemes (CIS) like unit trusts and enable regulated exposure to low-risk derivatives such as government bond futures. Tanzania should create risk-aligned pay frameworks for investment managers to prioritise long-term stability over short-term rewards. Misaligned incentive structures have caused excessive tail risk and herding in established derivatives markets. The Bank of Tanzania and CMSA should work with industry players to define incentive rules. Macroprudential regulation from the start is necessary due to the country's sensitivity to global market volatility and external shocks. Finally, Tanzania should seek regional regulatory harmonisation through SADC venues like CISNA, using cross-border learning from established markets. A well-planned, institutionally grounded, and regionally linked approach would help Tanzania avoid premature liberalisation and develop a derivatives market that boosts financial resilience and investment.

Regulators and key stakeholders should support standardised derivative contracts and derivatives exchanges to improve openness, accessibility, and confidence. Regulations should be adaptable and responsive, using regulatory sandboxes for safe experimentation and oversight. A responsive, regulatory system where stakeholders shape rules is essential. Collaboration keeps rules in line with institutional goals and market realities. Shariah-compliant derivative products would increase inclusivity and uptake in specialist industries like Islamic finance. The Bank of Tanzania, other regulatory organisations, and private institutions, the study recommend the collaboration in derivative training programs to enhance knowledge and technical expertise. Continuous professional development from the Tanzania National Board of Accountants and Auditors should cover derivative pricing, IFRS compliance, and risk management. Tax rebates or derivative position capital relief could encourage responsible adoption. Develop real-time market surveillance systems to monitor exposures, liquidity concerns, and systemic links. To prevent regulatory arbitrage and promote cross-border involvement, the East African Community (EAC) should harmonise derivatives legislation.

Author contributions

Ruva G. Tunze: Conceptualization, Formal analysis, Funding acquisition, Writing – original draft all 100%.

Evelyn M. Richard, Supervision 50%; Validation100%:

Eric Mkwizu: Supervision 50%, Writing – review & editing 100%

Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

The author received no direct funding for this research.

Data availability statement

The data that support the findings of this study are available from the corresponding author, **Ruva Tunze** ruvtunze@yahoo.co.uk , upon reasonable request.

REFERENCES

Al-Okaily, M., Alqudah, H. M., Al-Qudah, A. A., & Alkhwaldi, A. F. (2024). Examining the critical factors of computer-assisted audit tools and techniques adoption in the post-COVID-19 period: internal auditors perspective. *VINE Journal of Information and Knowledge Management Systems, 54*(5), 1062-1091. https://doi.org/10.1108/VJIKMS-12-2021-0311

Al-Slehat, Z. A. F., Al-Sharif, B. M., & Qwader, A. (2018). The factors affecting the use of financial derivatives' instruments: An applied study on the Jordanian commercial banking sector. *Accounting and Finance Research, 7*(3), 67-77. https://doi.org/10.5430/afr.v7n3p67

Al Janabi, M. A. (2024). Crises to opportunities: derivatives trading, liquidity management, and risk mitigation strategies in emerging markets. In. Liquidity dynamics and risk modeling (pp. 169-256). Palgrave Macmillan Cham. https://doi.org/10.1007/978-3-031-71503-7_3

Albayati, H., Kim, S. K., & Rho, J. J. (2020). Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach. *Technology in Society, 62,* 101320. https://doi.org/10.1016/j.techsoc.2020.101320

Allen, H. J. (2019). Regulatory sandboxes. *George Washington Law Review, 87*, 579-608. https://doi.org/10.2139/ssrn.3056993

Amirzadeh, S., Rasouli, D., & Dargahi, H. (2024). Assessment of validity and reliability of the Feedback Quality Instrument. *BMC Research Notes, 17*(1), 227. https://doi.org/10.1186/s13104-024-06881-x

Arner, D. W., Barberis, J. N., & Buckley, R. P. (2016). The emergence of RegTech 2.0: From know your customer to know your data. *44 Journal of Financial Transformation*, *79,* UNSW Law Research Paper, No. 17-63. https://ssrn.com/abstract=3044280 https://doi.org/10.2139/ssrn.3044280

Awrey, D. (2015). Complexity, innovation, and the regulation of modern financial markets. *Harvard Business Law Review, 2*, 235-294. https://doi.org/10.2139/ssrn.1988968

Awrey, D., & Macey, J. (2022). The promise and perils of open finance. *Yale Journal on Regulation, 40*, 1-61. https://doi.org/10.2139/ssrn.4045640

Bag, S., Rahman, M. S., Gupta, S., & Wood, L. C. (2023). Understanding and predicting the determinants of blockchain technology adoption and SMEs' performance. *The International Journal of Logistics Management*, *34*(6), 1781-1807. https://doi.org/10.1108/ijlm-01-2022-0017

Barak-Corren, N., & Kariv-Teitelbaum, Y. (2021). Behavioral responsive regulation: Bringing together responsive regulation and behavioral public policy. *Regulation & Governance*, *15*, S163-S182. https://doi.org/10.1111/rego.12429

Battiston, S., Caldarelli, G., May, R. M., Roukny, T., & Stiglitz, J. E. (2016). The price of complexity in financial networks. *Proceedings of the National Academy of Sciences*, *113*(36), 10031-10036. https://doi.org/10.1073/pnas.1521573113

Battiston, S., Farmer, J. D., Flache, A., Garlaschelli, D., Haldane, A. G., Heesterbeek, H., Hommes, C., Jaeger, C., May, R., & Scheffer, M. (2016). Complexity theory and financial regulation. *Science*, *351*(6275), 818-819. https://doi.org/10.1126/science.aad0299

Bhadra, S., & Singh, N. (2024). Factors and determinants of derivatives use: An Indian perspective. *Adhyayan: A Journal of Management Sciences, 14*(1), 62-67. https://doi.org/10.21567/adhyayan.v14i1.11

BIS. (2023). The bank for international settlements financial derivative global data. *Finance & Development*, 1-5. https://doi.org/10.32614/cran.package.bisdata

Braithwaite, J. (2011). The essence of responsive regulation. *UBC Law Review, 44*, 475-520. https://doi.org/10.1093/oso/9780195136395.003.0002

Braithwaite, J. (2016). Responsive regulation and developing economies. *World Development*, *34*(5), 884-898. https://doi.org/10.1016/j.worlddev.2005.04.019

Chance, C. (2017). International regulatory update. *Law and Financial Markets Review, 11*(1), 41-52. https://doi.org/10.1057/palgrave.jcb.3040140

Chen, H., Li, L., & Chen, Y. (2021). Exploring success factors that impact artificial intelligence adoption in the telecom industry in China. *Journal of Management Analytics, 8*(1), 36-68. https://doi.org/10.1080/23270012.2020.1852895

Chiu, I. H. (2023). An institutional account of responsiveness in financial regulation-Examining the fallacy and limits of 'same activity, same risks, same rules' as the answer to financial innovation and regulatory arbitrage. *Computer Law & Security Review*, *51*, 105868. https://doi.org/10.1016/j.clsr.2023.105868

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340. https://doi.org/10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982-1003. https://doi.org/10.1287/mnsc.35.8.982

Donnelly, S. (2019). Financial Stability Board (FSB), Bank for International Settlements (BIS) and financial market regulation bodies. In *Research handbook on the European Union and international organizations* (pp. 360-385). Edward Elgar Publishing. https://doi.org/10.4337/9781786438935.00026

Drahos, P. (2017). *Regulatory theory: Foundations and applications*. ANU Press. https://doi.org/10.5553/tvt/187987052017008003010

Fabozzi, F. J. (2025). *Capital markets: institutions, instruments, and risk management*. MIT Press.

Fernando, Y., Ng, H. H., & Walters, T. (2015). Regulatory incentives as a moderator of determinants for the adoption of Malaysian food safety system. *British Food Journal*, *117*(4), 1336-1353. https://doi.org/10.1108/bfj-03-2014-0129

Frame, W. S., & White, L. J. (2014). Technological change, financial innovation, and diffusion in banking. In. A. N. Berger et al. (Eds.), *The Oxford handbook of banking* (pp. 486-507). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199640935.013.0019

Gai, P., Haldane, A., & Kapadia, S. (2011). Complexity, concentration and contagion. *Journal of Monetary Economics*, *58*(5), 453-470. https://doi.org/10.1016/j.jmoneco.2011.05.005

Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *Journal of enterprise information management*, *28*(1), 107-130. https://doi.org/10.1108/jeim-08-2013-0065

Gope, A. (2017). Accounting for derivative financial instruments: an analysis of disclosure determinants. *Amity Journal of Management Research*, *2*(1), 10-19.

Gope, A., & Mitra, G. (2018). Financial reporting and disclosure of derivative instruments: Impact of IFRS. Educreation Publishing.

Hair, Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., Ray, S., Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). Evaluation of reflective measurement models. *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook* (pp. 75-90). Springer. https://doi.org/10.1007/978-3-030-80519-7_4

Hairston, Brooks, & Marcus. (2019). Derivative accounting and financial reporting quality: A review of the literature. *Advances in accounting*, *44*, 81-94. https://doi.org/10.1016/j.adiac.2018.10.003

Hairston, Johnston, & Zhang. (2023). Auditing the derivative usage of bank-holding companies. *Accounting Horizons*, *37*(4), 67-84. https://doi.org/10.2308/horizons-2020-197

Hao, X., Sun, Q., & Xie, F. (2022). International evidence for the substitution effect of FX derivatives usage on bank capital buffer. *Research in International Business and Finance*, *62*, 101687. https://doi.org/10.1016/j.ribaf.2022.101687

Hee, P., & Song, W. (2017). Factors affecting derivatives use for life insurance companies. *International Journal of Economics and Finance*, *9*(12), 168-174. https://doi.org/10.5539/ijef.v9n12p168

Henkel, C. (2019). Using central counterparties to limit global financial crises. *University of Cincinnati Law Review*, *88*(2), 398. http://dx.doi.org/10.2139/ssrn.3530022

Hirsa, A. (2024). *Computational methods in finance*. Chapman and Hall/CRC. https://doi.org/10.1201/9780429094743

Jarvis, D. S. (2017). The OECD and the reconfiguration of the state in emerging economies: manufacturing 'regulatory capacity'. *Development and Change*, *48*(6), 1386-1416. https://doi.org/10.1111/dech.12343

Kidwell, D. S., Blackwell, D. W., & Whidbee, D. A. (2016). *Financial institutions, markets, and money*. John Wiley & Sons Book.

King, A., Goldfarb, B., & Simcoe, T. (2021). Learning from testimony on quantitative research in management. *Academy of Management Review*, *46*(3), 465-488. https://doi.org/10.2139/ssrn.3816190

Kobilarev, M., & Živanović, B. (2019). The Offer of Financial Derivatives in the Banking Sector of the Republic of Serbia. *Economic Analysis*, *52*(2), 43-63. https://doi.org/10.28934/ea.19.52.2.pp43-63

Kock. N (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (IJEC)*, *11*(4), 1-10. https://doi.org/10.4018/ijec.2015100101

Lewandowska, O. (2020). *Post-trade processing of OTC derivatives*. BoD–Books on Demand.

Li, D., Tang, F., & Jiang, J. (2019). Does environmental management system foster corporate green innovation? The moderating effect of environmental regulation. *Technology Analysis & Strategic Management*, *31*(10), 1242-1256. https://doi.org/10.1080/09537325.2019.1602259

Lien, T. T. H. (2022). *Board directors, financial derivatives, and corporate governance: The case of Vietnam*. Springer Nature. https://doi.org/10.1007/978-981-19-1400-3

Malaquias, R. F., & Zambra, P. (2020). Complexity in accounting for derivatives: Professional experience, education and gender differences. *Accounting Research Journal*, *33*(1), 108-127. https://doi.org/10.1108/arj-11-2017-0192

Ngisau, N., & Ibrahim, N. (2020). Technological innovation adoption in manufacturing sector: the moderator role of government support. *Journal of Economics, Business and Management*, *8*(3), 200-205. https://doi.org/10.18178/joebm.2020.8.3.637

Njoroge, N. N., Matumo, N. G., & Maina, K. E. (2013). Factors influencing development of financial derivatives markets: a survey of listed companies in Kenya. *Global Advanced Research Journal of Management and Business Studies, 2*(5), 258-267.

Poutanen, P., Soliman, W., & Ståhle, P. (2016). The complexity of innovation: an assessment and review of the complexity perspective. *European Journal of Innovation Management*, *19*(2), 189-213. https://doi.org/10.1108/EJIM-03-2014-0036

Rahman, A. (2015). Over-the-counter (OTC) derivatives, central clearing and financial stability. *Bank of England Quarterly Bulletin, 2015 Q3.* https://ssrn.com/abstract=2667510

Ranchordas, S., & Vinci, V. (2024). Regulatory sandboxes and innovation-friendly regulation: Between collaboration and capture. *Italian Journal of Public Law, 16*, 107. https://doi.org/10.2139/ssrn.4696442

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Schammo, P. (2021). Of standards and technology: ISDA and technological change in the OTC derivatives market. *Law and Financial Markets Review*, *15*(1-2), 3-37. https://doi.org/10.2139/ssrn.4059245

Schaupp, L. C., Festa, M., Knotts, K. G., & Vitullo, E. A. (2022). Regulation as a pathway to individual adoption of cryptocurrency. *Digital Policy, Regulation and Governance*, *24*(2), 199-219. https://doi.org/10.1108/dprg-08-2021-0101

Servais, J-P. (2020). The International Organization of Securities Commissions (IOSCO) and the new international financial architecture: what role for IOSCO in the development and implementation of cross-border regulation and equivalence? *European Company and Financial Law Review*, *17*(1), 3-10. https://doi.org/10.1515/ecfr-2020-0001

Silber, W. L. (1975). *Towards a theory of financial innovation*. Lexington, MA.: Lexington Books.

Simon, H. A. (2012). The architecture of complexity. In. *The roots of logistics* (pp. 335-361). Springer. https://doi.org/10.1007/978-3-642-27922-5_23

Sun, W., Dedahanov, A. T., Shin, H. Y., & Li, W. P. (2021). Using extended complexity theory to test SMEs' adoption of Blockchain-based loan system. *PLOS One, 16*(2), e0245964. https://doi.org/10.1371/journal.pone.0245964

Teo, H.-H., Wei, K. K., & Benbasat, I. (2003). Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS Quarterly, 27*(1), 19-49. https://doi.org/10.2307/30036518

Thinh, T. Q., Anh, L. H., & Dung, N. N. K. (2020). Factors affecting the development of the Vietnamese derivative securities market. *Investment Management and Financial Innovations*, *17*(4), 25-32. https://doi.org/10.21511/imfi.17(4).2020.03

Thomadakis, A., & Lannoo, K. (2021). Setting EU CCP policy–much more than meets the eye. Brussels: *CEPS-ECMI Study.* https://cdn.ceps.eu/wp-content/uploads/2024/02/Setting-EU-CCP-policy-much-more-than-meets-the-eye.pdf

Tunze, R., Richard, E. M., & Mkwizu, E. (2025). The dynamics of financial derivative attributes in predicting adoption intention: The mediating role of perceived benefit. *Available at SSRN,* 5329724. https://doi.org/10.2139/ssrn.5329724

Turner, J. R., & Baker, R. M. (2019). Complexity theory: An overview with potential applications for the social sciences. *Systems*, *7*(1), 4. https://doi.org/10.3390/systems7010004

Ullah, W., Zubir, A. S. M., & Ariff, A. M. (2024). Exploring the moderating effect of regulatory quality on the relationship between financial development and economic growth/economic volatility for developed and developing countries. *Borsa Istanbul Review*, *24*(5), 934-944. https://doi.org/10.1016/j.bir.2024.04.015

Verma, H. (2024). The Evolution of Futures and Options Markets: From agricultural roots to high-frequency trading. *African Journal of Commercial Studies*, *5*(2), 107-116. https://doi.org/10.59413/ajocs/v5.i.2.5

Wang, S., He, S., Yousefpour, A., Jahanshahi, H., Repnik, R., & Perc, M. (2020). Chaos and complexity in a fractional-order financial system with time delays. *Chaos, Solitons & Fractals*, *131*, 109521. https://doi.org/10.1016/j.chaos.2019.109521

Wang, Y.-S., Li, H.-T., Li, C.-R., & Zhang, D.-Z. (2016). Factors affecting hotels' adoption of mobile reservation systems: A technology-organisation-environment framework. *Tourism management*, *53*, 163-172. https://doi.org/10.1016/j.tourman.2015.09.021

Yazlyuk, B., Guley, A., Brukhanskyi, R., Shovkoplias, H., & Shvydka, T. (2018). Basic principles of financial markets regulation and legal aspects of the legislative requirements. *Investment Management & Financial Innovations*, *15*(1), 337-349. https://doi.org/10.21511/imfi.15(1).2018.28

Zakheos, M. (2022). *The derivatives market and systemic risk–lessons learned from the global financial crisis, regulatory failures and the post-crisis reforms* (Dissertation). School of Law, University of Central Lancashire, Cyprus. https://doi.org/10.2139/ssrn.4246292

Хоменко, І., Горобінська, І., Теслюк, Н., & Назаренко, Я. (2024). Problems and prospects of financial derivatives market development. *Київський економічний науковий журнал*(5), 150-157. https://doi.org/10.32782/2786-765x/2024-5-22

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