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DEVELOPING A KEY RISK DISCLOSURE QUALITY INDEX: A SCORING FRAMEWORK FOR MALAYSIAN PUBLIC-LISTED COMPANIES

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Abstract:

This paper develops a Key Risk Disclosure Quality (KRIS-DQ) Index to assess the quality of key risk disclosures in the annual reports of Malaysian public-listed companies. Drawing on Ibrahim and Hussainey's (2019) three-step approach to disclosure index construction, the KRIS-DQ Index integrates content analysis principles with a structured five-level scoring scale that captures disclosure presence, specificity, mitigation strategies, and the use of quantitative information. The index covers 18 key risk categories identified from KPMG's annual risk outlooks and is explicitly aligned with the Malaysian Code on Corporate Governance (MCCG) 2021 and Bursa Malaysia Listing Requirements, enabling structured evaluation of disclosure quality in relation to regulatory expectations. An illustrative application of the index demonstrates its ability to capture meaningful variation in disclosure quality across firms and risk categories, addressing key limitations of prior measures that focus predominantly on disclosure quantity rather than depth and decision usefulness. The KRIS-DQ Index provides a practical benchmarking and diagnostic tool for regulators, investors, and researchers, and offers a robust foundation for future empirical research on corporate risk disclosure quality in emerging market contexts, where institutional environments and enforcement variability heighten the need for more discriminating disclosure quality measures.

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Introduction

The COVID-19 pandemic has profoundly disrupted and redefined the global and Malaysian corporate landscapes, exposing the fragility of traditional business models and accelerating the emergence of complex, interconnected risks (Chambers, 2021; Klint, 2021). What began as a health crisis swiftly evolved into a multifaceted economic shock, heightening awareness of disaster risk, escalating cybersecurity threats (Tariq, 2021), disrupting global supply chains (Merih Araz et al., 2020) and revealing critical gaps in remote work infrastructures (Adekoya et al., 2022). In Malaysia, Movement Control Orders triggered sharp revenue declines for over 66% of firms, while the World Bank flagged liquidity constraints and weakening consumer demand as major risks (Kuriakose & Tran, 2020). These impacts were compounded by labour market disruptions, including talent shortages and retention challenges, as well as intensified supply chain and cybersecurity risks, now ranked among the top threats to growth in Malaysia (PwC, 2022). While digital transformation and health compliance served as proactive risk responses, they introduced new risks in data privacy and operational resilience (Bernama, 2023; Bø et al., 2023). In this turbulent environment, organizations cannot rely solely on reactive risk management approaches. Instead, they must adopt forward-looking, integrated risk management strategies that address both existing risks and the unpredictable nature of emerging risk (Aziz et al., 2020).

Given the significance of these emerging risks, it becomes essential to examine how such information is communicated to stakeholders. The primary source of risk-related information is the company's annual report, which serves as a key medium for corporate transparency and investor communication. Corporate risk disclosure is vital in investor decision-making, regulatory compliance, and financial stability. The annual report provides stakeholders with insights into a company's risk exposure, financial health, and operational outlook. Research has shown that risk disclosure significantly influences stakeholder perceptions and investment decisions (Ibrahim et al., 2022). Effective risk transparency not only enhances corporate credibility but also aids companies in developing better risk management strategies (Elamer, Ntim, & Abdou, 2020).

Globally, regulatory bodies have introduced a range of frameworks aimed at enhancing transparency and consistency in corporate risk disclosures. Prominent examples include the U.S. Securities and Exchange Commission's Financial Reporting Release No. 48, the German Accounting Standard GAS 5, IFRS 7, and the Basel II Accord, which collectively mandate

firms, especially in the financial sector, to disclose key risk exposures, particularly related to financial instruments and systemic risks. These initiatives underscore the global commitment to improving comparability, risk awareness, and informed decision-making among stakeholders. In Malaysia, a robust regulatory environment echoes these global standards. The Malaysian Financial Reporting Standard (MFRS 7) requires companies to disclose risks related to market, credit, and liquidity exposures, while the Companies Act 2016 mandates directors to outline significant risks affecting corporate operations. Bursa Malaysia Listing Requirements further reinforce transparency by requiring listed firms to disclose key risks and their mitigation strategies in annual reports. Importantly, the Malaysian Code on Corporate Governance (MCCG) 2021 elevates the role of the board in overseeing and disclosing both financial and non-financial risks, such as cybersecurity, sustainability, operational, and reputational risks, highlighting the strategic importance of risk management within corporate governance. Together, these international and national frameworks promote transparent and complete risk disclosures, creating a foundation for stakeholder trust and market integrity. They also underscore the growing need for high-quality risk disclosures, which serve as the basis for more accurate assessments of corporate risk reporting. However, the existence of regulatory requirements does not automatically ensure consistency or quality in corporate risk disclosure practices.

In measuring risk disclosure quality, previous research employed various indices to evaluate corporate transparency and effectiveness in risk reporting (Martikainen et al., 2015; Neifar & Jarboui, 2018; Domínguez & Gámez, 2014). These indices often differ significantly, driven mainly by researchers' distinct objectives and theoretical foundations, resulting in substantial methodological inconsistencies (Abdallah et al., 2015; Shivaani & Agarwal, 2020). Moreover, researchers used diverse measurement scales, ranging from simple binary coding of disclosures (Al-Hadi, Hasan, et al., 2016; Hassan, 2009) to more nuanced, composite measures integrating semantic attributes and quantitative dimensions (Domínguez & Gámez, 2014; Shivaani & Agarwal, 2020). Risk classifications in these studies typically focus on conventional categories like operational, financial, strategic, and governance risks (Alzead & Hussainey, 2017; Raimo et al., 2022). However, while these classifications provide broad coverage, they often fall short in capturing evolving risk dynamics, particularly emerging threats accentuated by events like the COVID-19 pandemic. Consequently, there remains a need for a more consistent and structured approach to assess risk disclosure quality, emphasizing the relevance and timely reporting of key current risks, rather than merely examining overall risk disclosure.

Despite growing demands for transparency, risk disclosure practices among Malaysian public-listed companies remain limited in scope and depth. Prior studies reveal a tendency to focus predominantly on financial and operational risks, often at the expense of emerging areas such as environmental and cybersecurity risks (Mohd Ali & Taylor, 2014a). Furthermore, Malaysia lags behind developed nations in both the volume and quality of risk disclosures (Abdullah & Shukor, 2017; Amran et al., 2009). A significant concern is the frequent absence of a clear definition of “risk,” which may lead to misperceptions. Risk can be interpreted differently, either narrowly as a threat (pre-modern view) or more broadly as both a threat and an opportunity (modern view), depending on contextual understanding (Ibrahim & Hussainey, 2019). This ambiguity can undermine the consistency and usefulness of disclosure. Additionally, many studies rely on outdated risk classifications that fail to reflect the evolving risk landscape, such as the emergence of ESG, digital, and geopolitical risks (Kiflee & Ali Khan, 2021). Moreover, there remains a strong emphasis on measuring the quantity of disclosure, often using sentence count (Kiflee & Ali Khan, 2021; Kiflee, Ali Khan, et al., 2020)

or binary coding (Ahmad et al., 2015; Khan et al., 2022), while relatively few studies assess the quality or contextual relevance of the information disclosed. This emphasis on disclosure quantity limits the practical utility of risk disclosures for stakeholders and constrains academic efforts to evaluate disclosure effectiveness comprehensively, compare findings across studies, and build theory grounded in evolving corporate risk realities. Against this backdrop of methodological inconsistency and evolving regulatory expectations, a structured and context-sensitive measurement framework becomes necessary.

This study advances the risk disclosure literature in three important ways. First, it moves beyond the dominant reliance on binary, checklist-based, and word-count measures that primarily capture the presence or volume of risk disclosures rather than their qualitative depth (Hassan, 2009; Al-Hadi et al., 2016; Mohd Ali & Taylor, 2014a; Kiflee et al., 2020). While such approaches provide useful benchmarks of disclosure quantity, they often do not distinguish between symbolic references to risk and more substantive explanations that articulate impact, mitigation strategies, and measurable outcomes (Martikainen et al., 2015; Shivaani & Agarwal, 2020). As noted in prior methodological reviews, the mere presence of risk-related sentences does not necessarily reflect the quality or decision usefulness of the information disclosed (Ibrahim & Hussainey, 2019; Mbithi et al., 2022). Consequently, disclosure quantity is frequently treated as a proxy for disclosure quality, despite limited assessment of specificity, strategic integration, or quantitative articulation. The KRIS-DQ Index addresses this limitation by introducing a structured five-level scoring framework that captures progressive disclosure quality, ranging from minimal or generic statements to quantified and strategically articulated risk reporting.

Second, the KRIS-DQ Index incorporates a contemporary taxonomy of key risks derived from KPMG's 2021–2023 Internal Audit Key Risk Areas publications, reflecting the post-pandemic risk landscape characterised by digital disruption, climate-related exposure, geopolitical uncertainty, supply chain vulnerability, and ESG accountability (KPMG, 2021, 2022a, 2022b). Prior risk disclosure studies have predominantly classified risks into broad financial, operational, and strategic categories (Amran et al., 2009; Mohd Ali & Taylor, 2014a; Abdullah et al., 2017), which, while useful, may not fully capture the evolving complexity of emerging risk domains highlighted in recent global disruptions. The COVID-19 pandemic and subsequent economic volatility have intensified attention toward business resilience, cybersecurity, climate risk, and regulatory change (Babatunde & Lukman, 2020; Ben-Amar et al., 2023; Malatji et al., 2022). By integrating these contemporary risk categories into a structured measurement framework, the KRIS-DQ Index enhances the temporal relevance and practical applicability of risk disclosure assessment within current governance environments.

Third, the KRIS-DQ Index is explicitly embedded within the Malaysian regulatory context, aligning with the expectations articulated in MCCG 2021 and Bursa Malaysia Listing Requirements concerning board-level oversight, risk identification, and mitigation disclosure. While prior disclosure indices have largely been developed as academic measurement constructs (Hassan, 2009; Alzead & Hussainey, 2017; Shivaani & Agarwal, 2020), they are not always directly anchored to specific regulatory guidance or governance codes. In contrast, the KRIS-DQ Index operationalises disclosure quality in a manner that reflects regulatory emphasis on meaningful articulation of key risks, internal controls, and mitigation strategies, as outlined in Malaysian corporate governance frameworks. This regulatory alignment enhances the practical applicability of the index as both a benchmarking and diagnostic tool, enabling evaluation not only of disclosure completeness but also of its substantive quality in

relation to governance expectations. Importantly, this regulatory alignment enables the index to function as an evaluative instrument for assessing whether corporate disclosures reflect not merely voluntary transparency, but substantive compliance with governance expectations articulated in MCCG 2021 and Bursa Malaysia Listing Requirements. This role is particularly relevant in emerging market settings, where disclosure depth and enforcement consistency may vary (Ibrahim & Hussainey, 2019; Mbithi et al., 2022).

Beyond regulatory alignment, the emerging market setting introduces additional analytical relevance. Emerging markets are often characterised by concentrated ownership structures, varying enforcement intensity, and a greater prevalence of boilerplate or compliance-oriented disclosures. In such environments, quantity-based disclosure measures may overstate transparency by failing to distinguish between symbolic compliance and substantive risk communication. Malaysia therefore provides a theoretically relevant context in which to develop and test a more discriminating disclosure quality index that captures depth, mitigation articulation, and quantification.

Literature Review

This literature review examines prior research on corporate risk disclosure to establish the theoretical, regulatory, and empirical foundations for developing the KRIS-DQ Index. It reviews the main theoretical perspectives, the Malaysian risk disclosure environment, and evidence from prior Malaysian and international studies, before identifying key limitations in existing risk disclosure measures. The review concludes by outlining contemporary key risk areas that inform the construction of the KRIS-DQ Index.

Theoretical Foundation in Past Research

Corporate risk disclosure is a complex and multifaceted concept, with no single theory fully explaining its quality and variations across firms (Mbithi et al., 2022). Among the most frequently applied theories in risk disclosure research are Agency Theory, Signaling Theory, and Legitimacy Theory (Ntim, Lindop, & Thomas, 2013). Agency Theory (Jensen & Meckling, 1976) suggests that information asymmetry exists between managers (agents) and shareholders (principals), where managers may selectively disclose risk information to protect their interests (Elshandidy & Neri, 2015). To reduce agency costs, firms engage in risk disclosure to reassure investors and strengthen governance mechanisms (Ntim et al., 2017). Meanwhile, Signalling Theory (Spence, 1973) explains that firms use voluntary risk disclosure to signal financial stability, particularly when operating in high-risk environments or seeking investor confidence. Legitimacy Theory (Suchman, 1995) further suggests that risk disclosure is a means for firms to align with societal expectations, particularly when under regulatory or reputational scrutiny. However, inconsistencies in what firms disclose and how transparently they report risks raise concerns about selective and symbolic disclosures, highlighting the need for a structured risk disclosure assessment tool.

To address the theory considerations, the KRIS-DQ Index is developed as a measurement framework to systematically assess the quality, transparency, and completeness of key risk disclosures among Malaysian public-listed companies. Since firms often engage in selective, symbolic, or regulatory-driven risk disclosure (Elshandidy & Neri, 2015), the KRIS-DQ Index ensures that risk disclosures are meaningful rather than generic or boilerplate. Unlike traditional approaches that focus on whether a company discloses risks, KRIS-DQ Index

evaluates how well companies communicate their risks, ensuring that disclosures are decision-useful, specific, and measurable.

Risk Disclosure Landscape in Malaysia

The Companies Act 2016 sets the legal foundation for corporate reporting in Malaysia. While it does not impose strict requirements for non-financial risk disclosure, the Fifth Schedule encourages directors to provide an overview of principal risks and uncertainties in their reports. This voluntary disclosure promotes accountability and urges directors to communicate material risks that could impact the company's performance and sustainability.

Complementing the Companies Act, the Malaysian Financial Reporting Standard (MFRS) 7, adopted from IFRS 7, requires companies to disclose the nature and extent of risks related to financial instruments. This includes credit, market, and liquidity risks, along with explanations of how such risks are managed. Although MFRS 7 significantly enhances financial risk transparency, it does not extend to non-financial risks such as strategic, regulatory, or ESG-related issues, highlighting a gap in the current disclosure framework.

The MCCG 2021, issued by the Securities Commission Malaysia, addresses this gap by expanding the scope of risk oversight. Principle B of the MCCG emphasizes the board's responsibility in managing and disclosing risks. Guidance 10.2 specifically calls for companies to disclose how key risk areas are identified and assessed, covering financial, operational, regulatory, reputational, cybersecurity, and sustainability risks. This provision aligns with international best practices and encourages a comprehensive and forward-looking approach to risk reporting.

Further, Bursa Malaysia Listing Requirements establish mandatory risk disclosure obligations for listed companies. Chapter 9 requires the inclusion of a Management Discussion & Analysis in annual reports, where companies must explain material risks, their impact, and the corresponding mitigation strategies. Chapter 15 reinforces board accountability through the requirement for a Statement on Risk Management and Internal Control. To aid compliance, Bursa Malaysia has issued additional guidance documents, such as the Management Discussion & Analysis Disclosure Guide and The Statement on Risk Management and Internal Control: Guidelines for Directors of Listed Issuers. These documents emphasize meaningful, balanced, and company-specific disclosures, discouraging generic statements and encouraging clear articulation of key risks, assessment methodologies, and ongoing mitigation efforts.

Despite the presence of regulations, standards, and governance guidelines mandating comprehensive risk management and disclosure, empirical evidence suggests that risk reporting practices among Malaysian firms remain uneven and relatively underdeveloped. Abdullah and Shukor (2017) and Amran et al. (2009) document lower levels of voluntary and quantitative risk disclosure compared to developed markets. Although more recent studies indicate gradual improvements in disclosure volume (Kiflee & Ali Khan, 2021), the overall depth and explanatory quality of reported risks remain limited. Content analyses further reveal selective patterns, with firms emphasizing financial and operational risks while underreporting strategic, environmental, and technology-related risks (Mohd Ali & Taylor, 2014b; Abdullah et al., 2015; Zadeh et al., 2016). These findings suggest that improvements in regulatory frameworks have not consistently translated into substantive and balanced risk communication,

and that disclosure practices may still reflect compliance-oriented or impression-management tendencies rather than comprehensive transparency.

Malaysian-Based Risk Disclosure Studies

Based on a review of studies examining risk disclosure practices among Malaysian companies, which are presented in Table 1, it is evident that research has consistently relied on certain theoretical frameworks to interpret findings, with the Agency Theory and Signaling Theory emerging as the most prevalent. Agency Theory is commonly utilized to explain managerial incentives for disclosing information, emphasizing the reduction of information asymmetry between managers and stakeholders. Signaling Theory complements this perspective by suggesting that firms disclose additional risk-related information to convey their strong financial health and operational stability, particularly when they seek external capital or need to enhance investor confidence.

Other theories such as Stakeholder Theory, Political Cost Theory, Resource Dependence Theory, and Upper Echelons Theory also appear in the reviewed studies. The choice of theory primarily depends on the research objectives and the specific focus of the study. For example, Resource Dependence Theory has been employed when examining the relationship between corporate governance structures and disclosure practices, highlighting how boards manage external dependencies through information transparency.

A notable gap observed in Malaysian risk disclosure research is the frequent omission of explicit definitions of risk. Many studies assume readers inherently understand risk without clearly stating its conceptual boundaries. Among the few explicit definitions, the most referenced definition was adapted from Linsley & Shrives (2006), describing risk as uncertainty associated with potential gain and loss. Another definition, provided by Abdullah et al. (2017), described risk as any harm or threat or opportunity that arises from business environment changes, illustrating a more dynamic view of risk.

Analyzing the classification of risks disclosed by Malaysian companies, a clear pattern emerges. Most studies classify risks into three broad categories: financial risks, non-financial risks, and risk management frameworks. Financial risks typically encompass liquidity, interest rate, foreign exchange, and credit risks. Non-financial risks cover operational, environmental, integrity, strategic, empowerment, and information processing and technology risks. The risk management framework includes strategies and systems used to mitigate or control identified risks. Among these, non-financial risks consistently receive significant attention, reflecting their growing importance in investor decision-making processes. However, recent global disruptions, particularly the COVID-19 pandemic, have dramatically changed risk dynamics, elevating operational, strategic, and cyber-security risks in importance. The changing landscape indicates that future research should focus more explicitly on these evolving areas.
Most Malaysian studies focus primarily on the quantity of risk disclosure rather than the quality of the information provided. For instance, Amran et al. (2009), Mohd Ali and Taylor (2014a), and Zadeh et al. (2016) rely predominantly on sentence counts to capture disclosure volume, with comparatively few studies examining qualitative dimensions through Likert-type scales or binary coding. This quantity-driven approach may obscure important nuances relating to the relevance, specificity, and decision-usefulness of disclosed risk information.

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Furthermore, inconsistencies are evident in the measures used across different studies, presenting challenges for comparability and generalizability. Researchers employed various methods such as binary coding, sentence counts, Likert-scale surveys, and unweighted disclosure indices. These inconsistencies impact the validity and reliability of conclusions drawn from these studies and underline the urgent need for standardized measurement frameworks to enhance comparability.

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Table 1: Malaysian-Based Risk Disclosure Studies

Author	Theories Used	Definition of Risk	Definition Reference	Classification of Risk	Methodology	Year of Study
Amran et al. (2009)	Stakeholder Theory	No definition	N/A	Financial risk, operational risk, empowerment risk, information processing and technology risk, integrity risk, strategic risk	Sentence count	2005
Akhtaruddin & Haron (2010)	Agency Theory	No definition	N/A	Not explicitly categorized	Binary code	2003
Ghazali (2012)	Not explicitly mentioned	No definition	N/A	Financial, operational, compliance and regulatory, business risk	Likert-scale survey	2009
Madi et al. (2014)	Agency Theory and Resource Dependency Theory	No definition	N/A	Strategic information, non-financial information, financial information	Binary code	2009
Mohd Ali & Taylor (2014a)	Not explicitly mentioned	Risk is uncertainty associated with both potential gain and loss.	Linsley and Shrives (2006)	Operational risk, environmental risk, financial risk, strategic risk	Sentence count	2009
Mohd Ali & Taylor (2014b)	Upper Echelons Theory	No definition	N/A	Operational risk, environmental risk, financial risk, strategic risk	Sentence count	2009
Ahmad et al. (2015)	Agency Theory	No definition	N/A	Risk management, internal control	Binary code	2013
Zadeh et al. (2016)	Political Cost Theory	No definition	N/A	Financial risk, non-financial risk, risk management framework	Sentence count	2001-2011

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Abdullah et al. (2017)	Resource Dependence Theory	Defined as harm and threat or opportunity and prospect	Linsley & Shrives (2006) Cabedo & Tirado (2004)	Financial, operational, empowerment, integrity, information processing and technology, strategic risk	Sentence count	2011
(Mohd Ali et al., 2018)	Agency Theory and Signalling Theory	No definition	N/A	Financial, operational, empowerment, integrity, information processing and technology, strategic risk	Sentence count	2014
Kiflee et al. (2020)	Agency Theory and Signalling Theory	No definition	N/A	Financial risk, non-financial risk, risk management framework	Sentence count	2008-2017
Khan et al. (2021)	Agency Theory and Signalling Theory	No definition	N/A	Voluntary and mandatory risk disclosure	Sentence count and binary code	2010-2018
Kiflee et al. (2021)	Agency Theory and Signalling Theory	Communication related to company's strategies, operations, external elements	Jorgensen and Kirschenheiter (2003)	Financial, non-financial, risk management framework	Sentence count	2008-2017

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The reviewed studies predominantly analyse data from periods up to 2018, leaving recent developments inadequately explored. Given the rapid shifts in global and national economic conditions, regulatory landscapes, and business practices since the onset of COVID-19, more current analyses are imperative. Studies from 2020 and 2021, such as those by (Kiflee et al., 2020) and Khan et al. (2021), began addressing this gap but still lack comprehensive exploration of post-pandemic shifts in disclosure practices and their implications.

Existing Risk Disclosure Indices

Table 2 provides a structured comparison of past risk disclosure indices, illustrating their variability in methodology and evaluation focus, tailored to the specific research context and guided by distinct theoretical underpinnings. The most prevalent theoretical frameworks observed across studies include Agency Theory and Signalling Theory (e.g., Domínguez and Gámez, 2014; Martikainen et al., 2015; Hadi et al., 2016). These theories posit that companies disclose risk-related information to minimize information asymmetry between management and stakeholders and to signal their risk management effectiveness. However, other studies have combined these theories with Institutional Theory, Legitimacy Theory, Proprietary Costs Theory, Political Costs Theory, Resource Dependence Theory, and even Positive Accounting Theory (e.g., Abdallah et al., 2015; Al-Maghzom et al., 2016; Shivaani & Agarwal, 2020; Hassan, 2009). This diversity underscores that the choice of theoretical framework largely depends on specific research objectives, whether to explore managerial incentives, corporate governance dynamics, or external regulatory pressures and market perceptions.

Analyzing the classifications of risk within these indices reveals notable patterns. Most studies typically categorize risks into strategic, operational, financial, environmental, and governance-related risks. Operational and financial risks are consistently the most analyzed across various indices, reflecting their direct impact on financial performance and stakeholder interests. For instance, Neifar and Jarboui (2018), Alzead and Hussainey (2017), and Raimo et al. (2022) notably included financial and operational risks in their assessments. Meanwhile, emerging categories such as Sharia compliance risks in Islamic contexts and demographic trait-related risks reflect the adaptation of indices to specific contexts and regions. Interestingly, some studies have broadened their scopes to include integrity risks, empowerment risks, and technological risks, reflecting the evolving risk landscape influenced by global developments. Events such as the COVID-19 pandemic have further reshaped the dynamics of risk management, highlighting previously underexplored risks such as supply chain disruptions, remote working vulnerabilities, and business continuity management, which contemporary indices must increasingly consider.

The scale or measurement methods used to quantify risk disclosures demonstrate significant variety, leading to potential inconsistencies in findings across studies. Binary coding (disclosed/not disclosed) is among the most common methods (Hassan, 2009; Hadi et al., 2016; Shivaani & Agarwal, 2020), primarily due to its simplicity and ease of interpretation. However, several other studies employ more nuanced scales such as ratio scales, logarithmic scales, frequency counts, and composite measures incorporating semantic attributes. Domínguez and Gámez (2014) utilized a refined 0–3 scale ranging from no disclosure to quantitative estimations, while Martikainen et al. (2015) implemented a logarithmic scale based on word count and coverage. Shivaani and Agarwal (2020) developed a comprehensive composite measure, integrating semantics (nature, tone, time orientation) with quantity, showcasing an advanced attempt at capturing disclosure quality. The varied scales highlight methodological

diversity, which, while reflecting innovative approaches, introduces comparability challenges and possible inconsistencies due to the subjectivity inherent in certain measurement methods.

Moreover, sources for constructing these indices are equally diverse, ranging from original indices developed explicitly for individual studies to those adapted from regulatory frameworks and previous literature. Indices like those of Abdallah et al. (2015) and Al-Maghzom et al. (2016) were developed uniquely for their studies, whereas others like Martikainen et al. (2015) and Miihkinen (2012) relied heavily on national accounting standards such as those from the Finnish Accounting Practice Board. Additionally, authors like Shivaani and Agarwal (2020) adapted and expanded indices from previous studies, including Ntim et al. (2013) and Linsley and Shrives (2006). Such variability in sources introduces inconsistencies, particularly in comparability and generalizability across different contexts, sectors, and time frames.

The consequences of these inconsistencies are substantial. They impact the robustness of findings, making it challenging to generalize conclusions across contexts and potentially reducing stakeholder confidence in risk disclosures. Subjective interpretation of index components, regional specificity, and the inherent variability in methodological approaches may significantly influence outcomes and policy recommendations. These methodological disparities highlight the necessity for greater standardization and clearer methodological transparency in risk disclosure research. Future studies should strive to address these limitations by adopting more standardized and universally applicable indices, perhaps integrating multiple methodological approaches to improve robustness, comparability, and generalizability across different research contexts and geographic settings.

Table 2: Comparison Of Past Risk Disclosure Indices

Authors	Country	Theories Used	Classification of risk	Scale (If any)
Hassan (2009)	UAE	Positive accounting theory and Institutional theory	General risk, accounting policies, financial instruments, derivative hedging, reserves, segment information, financial and other risks	Binary code (disclosed/not disclosed)
Miihkinen (2012)	Finland	Agency theory and Signaling theory	Strategic risks, operational risks, financial risks, damage risks, risk management	Quantity (word count), semantic properties (qualitative and quantitative information, coverage)
Domínguez & Gámez (2014)	Spain	Agency theory, Signaling theory, Political costs theory and	Financial risks, operational, business, environmental, new investments, reputation, country risks	0-3 scale (0: not disclosed, 1: vague, 2: specific, 3: quantitative estimations)

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		Proprietary costs theory		
Abdallah et al. (2015)	GCC Countries	Agency theory and Institutional theory	Accounting policies, derivatives hedging, financial risks, general risks, financial instruments, reserves, segment information	Ratio scale (proportion of words related to risks)
Martikainen et al. (2015)	Finland	Agency theory	Strategic risks, operational risks, financial risks, damage risks, risk management	Logarithmic scale (number of risk disclosure words), Coverage (inverse Herfindahl index)
Madrigal et al. (2015)	Spain	Stakeholder theory	General risk information	0-4 scale (0: not disclosed, 1: minimum coverage, 2: descriptive, 3: quantitative, 4: complete or exhaustive)
Al-Maghzom et al. (2016)	Saudi Arabia	Upper Echelons Theory, Agency Theory and Signaling Theory	Corporate governance risks, financial risks, demographic traits related risks	Binary code (disclosed/not disclosed)
Al-Hadi et al. (2016)	GCC Countries	Agency Theory	Political risks, financial risks, market risks	Binary code (disclosed/not disclosed)
Alzead & Hussainey (2017)	Saudi Arabia	Agency Theory and Signaling Theory	Financial risks, non-financial risks, market risks, operational risks, environmental risks	Binary code (disclosed/not disclosed)
Neifar & Jarboui (2018)	Various Islamic countries	Agency theory and Signaling theory	Operational risks, Shariah compliance risks, legal risks	Binary code (disclosed/not disclosed), Quantity (frequency count), Quality (score for qualitative, quantitative, forward-looking)

Amrin (2019)	Indonesia	Agency theory and Signaling theory	Financial risks, operational risks, empowerment risks, information processing and technology risks, integrity risks, strategic risks	Binary code (disclosed/not disclosed)
Elamer et al. (2020a)	MENA Countries	Neo-institutional theory	Financial risks, operational risks, strategic risks	Binary code (disclosed/not disclosed), Weighted scale for qualitative and quantitative information
Elamer et al. (2020b)	MENA Countries	Agency theory, Signaling theory, Legitimacy theory and Resource dependence theory	Operational risks, Sharia non-compliance risks, legal risks	Binary code (disclosed/not disclosed), qualitative and quantitative measures
Shivaani & Agarwal, (2020)	India	Agency theory, Proprietary cost theory and Signaling theory	General risk, operational risk, financial risk, management-related risk	Composite measure (quantity of disclosure, semantic attributes: nature, time-orientation, tone)
Raimo et al. (2022)	24 countries	Agency theory	General risk information, environmental health and safety risks, accounting policies, financial instruments, segment information, financial and other risks	Binary code (disclosed/not disclosed)

Key Risk Areas

In response to the evolving complexities of the post-pandemic business landscape, the KPMG Annual Internal Audit Key Risk Areas report presents a timely and relevant list of emerging risks that reflect current organizational challenges. This list is well supported by recent academic literature, which reinforces the relevance of risks such as business resilience (Babatunde & Lukman, 2020), climate change (Ben-Amar et al., 2023), and cybersecurity (Malatji et al., 2022). Many of these concerns are also mirrored in PwC's 2022 Global Risk Survey, Malaysia Cut, which highlights parallel priorities, including supply chain vulnerabilities, talent pipeline risks, cybersecurity threats, and climate-related challenges,

demonstrating convergence across industry benchmarks. These concerns are further echoed in national policy agendas, such as the Twelfth Malaysia Plan, which underscores the need for long-term sustainable growth, institutional resilience, and strong governance. The Plan emphasizes critical areas such as climate action, disaster risk reduction, digital infrastructure, cybersecurity legislation, and ESG accountability, further aligning national priorities with the broader risk landscape addressed by both KPMG and PwC. Together, these frameworks reflect a shared urgency to strengthen Malaysia's capacity to anticipate, withstand, and recover from multifaceted risk events.

The literature further substantiates KPMG's framework, providing robust support for these identified risk areas. For instance, Babatunde and Lukman (2020) underscore business resilience's critical role in navigating fluctuating revenue streams, advocating for timely, transparent disclosures regarding risks and mitigation measures. Purnomo et al. (2021) argue that businesses adopting flexible and creative strategies post-crisis can capitalize on emerging opportunities, thereby reinforcing resilience. Similarly, Ben-Amar et al. (2023) emphasize the significance of high-quality climate-related risk disclosures, particularly for firms in carbon-intensive sectors vulnerable to post-pandemic disruptions. Maintaining stakeholder trust through transparent disclosures can significantly influence investor perceptions, thereby safeguarding companies against future uncertainties.

Supply chain risks, which were heightened during and after the pandemic, further underscore the necessity of effective risk management frameworks. Merih Araz et al. (2020) and Bø et al. (2023) emphasize comprehensive supply chain management as integral to business continuity, especially amid disruptions in global supply networks. Concurrently, Malatji et al. (2022) and Pérez-Morón (2022) highlight increasing cybersecurity vulnerabilities driven by digital transformation and interconnected systems, recommending stringent cybersecurity measures to protect critical infrastructure. Geopolitical considerations, another critical risk area identified by Rajendran (2021), stress the need for organizations to enhance enterprise resilience amid trade tensions, restrictions, and international mobility challenges post-COVID-19. Effective talent and workforce management strategies, as discussed by Adekoya et al. (2022), further illustrate crucial organizational capabilities required to attract and retain talent in a transforming work environment.

Table 3: Key Risk Areas Based on KPMG's Publication

Key risk area post-COVID-19 by KPMG		
2021	2022	2023
Business resilience	Talent management and succession planning and regulation	Economical and geopolitical uncertainty
Talent pipeline	Changes in GCC tax landscape	Climate change
Fraud and the exploitation of operational disruption	Evolving compliance and regulation	Talent acquisition and retention

Climate change: the next crisis	Supply chain disruption	ESG (Environmental, Social and Governance) reporting
Third party management: supply chain disruption and vendor solvency	Business resilience	Cyber security and data privacy
Cyber security and data privacy in the expended work environment	Cyber and data security	Organizational culture and behaviour
Culture and behaviour and soft control	Liquidity management	Third-Party relationships and supply chain
Regulatory driven risk	Digitalization and intelligent automation	Digital disruption and new technologies
Data management and data and analytics	Managing third-party relationships	Business continuity and crisis response
Digitalisation and intelligent automation	Environmental, social and governance (ESG)	Mergers and acquisitions

Defining Risk and Risk Disclosure

The lack of a universally accepted definition of risk among researchers has led to inconsistencies in the way risk is perceived and communicated (Mbithi et al., 2022). According to Elshandidy et al. (2015), the absence of a standard risk concept contributes to ambiguities in risk disclosure research. Moreover, many studies (e.g., Raimo et al., 2022) do not explicitly define risk, assuming that readers inherently understand its meaning. This assumption, however, creates confusion among financial report users and researchers (Ibrahim & Hussainey, 2019). A well-defined risk concept is therefore crucial for ensuring clarity and comparability in risk disclosure studies.

Earlier research commonly referenced Linsley and Shrives' (2006) definition of risk, which remains one of the most widely used in risk disclosure studies. This definition considers risk as the communication of any existing or potential opportunities, prospects, hazards, dangers, harms, threats, or exposures that have already impacted the company or may influence its future operations. Furthermore, it incorporates the management of such opportunities and risks, recognizing risk as a two-sided concept with both positive and negative outcomes. Ibrahim and Hussainey (2019) describe this as the modern perspective on risk, acknowledging that companies may disclose risks that present potential growth opportunities alongside those that pose threats. However, earlier literature predominantly focused on the negative aspects of risk, aligning with pre-modern definitions. For example, Horcher (2005) describes risk as the possibility of loss. Furthermore, Ibrahim and Hussainey (2019) argue that users of financial reports tend to focus on threats and losses when analyzing risk disclosure sections, suggesting that a negative risk perspective may be more aligned with stakeholder expectations.

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Regulatory perspectives in Malaysia further reinforce the notion that risk is primarily associated with negative consequences. The MCCG 2021 mentions risk in the context of reducing corruption and mismanagement, while risk management is explicitly stated as focusing on identifying threats and opportunities. However, when discussing risk in isolation, MCCG frequently links it with controls and mitigation strategies, indicating an implicit negative connotation. Similarly, in the Statement on Risk Management and Internal Control: Guidelines for Directors of Listed Issuers, there is no explicit definition of risk, but the document emphasizes the importance of assessing and monitoring key business risks to protect shareholder investments. Additionally, it highlights how an effective risk management process enables better strategic decision-making by identifying potential threats to performance and profitability. Furthermore, Chapter 9 of the Bursa Malaysia Listing Requirements frequently associates risk with the need for mitigation measures, suggesting that risks are perceived as negative elements that could adversely impact business operations.

Malaysian-based academic research further reflects this conceptual divide regarding the definition of risk. Many studies, such as Akhtaruddin and Haron (2010), Ahmad et al. (2015), and Mohd Ali et al. (2018), do not explicitly define risk, assuming that readers already understand its fundamental meaning. Amran et al. (2009) was among the early Malaysian studies that explicitly defined risk in a negative context, whereas later research, such as Mohd Ali and Taylor (2014a) and Abdullah et al. (2017), adopted a broader perspective that incorporates both positive and negative aspects of risk. However, given that regulatory frameworks and financial reporting users tend to associate risk with threats, uncertainties, and negative business impacts, this study adopts a negative definition of risk, focusing on threats, hazards, and exposures that may harm a company's financial position, operations, or sustainability. The decision to adopt this negative definition is influenced by the strong arguments presented by Ibrahim and Hussainey (2019) and the implicit inclination towards risk as a negative factor in MCCG, Bursa Malaysia Listing Requirements, and SORMIC. By standardising this perspective, the KRIS-DQ Index ensures alignment with regulatory expectations and enhances the comparability of risk disclosures across firms.

Risk disclosure, in this study, is defined as the communication of threats, uncertainties, and exposures that may negatively impact a company’s financial position, operations, or sustainability, along with the measures taken to mitigate or manage these risks. By framing risk disclosure in this manner, the KRIS-DQ Index remains consistent with the prevailing regulatory and research perspectives that view risk as a negative business factor requiring control and mitigation.

Developing KRIS-DQ Index

The disclosure index will be developed in three steps, as outlined by Ibrahim and Hussainey (2019). First, a disclosure checklist will be created using existing accounting standards, regulations, relevant publications and prior research. Second, the disclosure report will be examined using a coding scheme to determine whether or not each checklist item is present and the extent of the explanation. Finally, the scores assigned to each firm-year observation will be added together and divided by the maximum index score to determine the level of actual disclosure and the disclosure index value.

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Identifying Key Risks

Identifying relevant risk disclosure items is the first step in developing the KRIS-DQ Index. This study adopts KPMG's "Internal Audit: Key Risk Areas" publications for 2021, 2022, and 2023 as the primary reference for identifying key risks. KPMG's global credibility and role in advising corporate governance and audit functions lends legitimacy to the selected risk areas. These reports reflect the heightened urgency for risk preparedness in the wake of the COVID-19 pandemic, which triggered structural changes across business models, talent management, digital infrastructure, and regulatory expectations (KPMG, 2021, 2022a, 2022b). The relevance of these risks is further substantiated by the MCCG 2021 and the Twelfth Malaysia Plan, both of which emphasise governance integrity, climate change, cybersecurity, and resilience-building. A diverse body of academic literature also affirms the significance of these risks—highlighting issues such as business continuity (Babatunde & Lukman, 2020), climate risk disclosure (Ben-Amar et al., 2022), digital and cyber vulnerabilities (Malatji et al., 2022), and talent retention challenges in the post-pandemic era (Adekoya et al., 2022). Risk definitions in this study are adapted from KPMG's descriptions and reinforced by insights from related scholarly and policy sources. Outlined in table 4 are the key risk areas and their corresponding definitions.

Table 4: Key Risk Areas and Their Definitions

No.	Key risk area	Definitions
1	Business Resilience	The risk of failing to adapt to disruptions, maintain critical operations, and recover effectively from crises such as pandemics, economic shocks, natural disasters, or geopolitical events. Includes governance integration and long-term preparedness.
2	Talent Pipeline and Retention	The risk of not ensuring the availability of skilled employees through recruitment, retention, and development strategies. Includes challenges from hybrid work, succession planning, and aligning workforce needs with business goals.
3	Fraud Risk	The risk of unethical or fraudulent activities due to weak controls, governance lapses, or external threats. Includes heightened risks during economic stress and evaluating fraud detection systems.
4	Organizational Culture and Behavior	The risk of poor values or ethical standards impacting decision-making, compliance, and control effectiveness. Includes challenges in hybrid work environments and use of soft control audits.
5	Climate Change	The risk of environmental impacts and sustainability challenges disrupting operations or harming reputations. Includes preparedness for climate-related risks and ESG integration.

6	Third-Party Relationships and Supply Chain	The risk of disruptions or failures in vendor relationships and supply chains. Includes vendor insolvency, geopolitical impacts, ESG considerations, and governance weaknesses.
7	Cybersecurity and Data Privacy	The risk of data breaches, cyberattacks, and privacy violations, particularly in remote/hybrid environments. Includes third-party risks and adherence to cybersecurity frameworks.
8	Regulatory-Driven Risk	The risk of non-compliance with evolving regulations at various levels, potentially leading to fines or operational disruptions. Includes proactive compliance and GRC system integration.
9	Data Management and Analytics	The risk of poor data management or analysis, affecting data integrity, privacy, and decision-making. Includes ethical use of data and embedding analytics in audit processes.
10	Digital Disruption and Emerging Technologies	The risk associated with adopting technologies like AI, robotics, and automation. Includes governance, integration, cybersecurity risks, and long-term monitoring frameworks.
11	Changes in Tax Landscape	The risk of failing to adapt to tax changes that leads to penalties or inefficiencies. Includes building robust compliance frameworks.
12	Evolving Compliance and Regulation	The risk of inadequate systems to manage regulatory complexity. Includes legal, operational, and reputational risks, and use of automation in compliance monitoring.
13	ESG Reporting	The risk of failing to meet ESG disclosure expectations or regulations. Includes alignment with international standards and maintaining ESG governance and metrics.
14	Liquidity and Cash Flow Management	The risk of poor cash flow or funding management, particularly during economic stress. Includes use of analytics to optimize cash and working capital.
15	Economic and Geopolitical Uncertainty	The risk of macroeconomic or geopolitical instability affecting business operations. Includes inflation, sanctions, and capital planning implications.
16	Mergers and Acquisitions	The risk of governance, integration, or due diligence failures during corporate transactions. Includes synergy realization and cultural integration challenges.
17	Business Continuity and Crisis Response	The risk of inadequate preparation or response to crises (e.g., cyberattacks, disasters). Includes scenario planning, crisis simulation, and governance oversight.

18	Ethical Concerns and Soft Controls	The risk of weak ethical oversight affecting behavior and decisions. Includes use of surveys and audits to evaluate cultural alignment and governance gaps.

Determining Coding Scheme

The development of the KRIS-DQ Index scoring scale draws its foundation from key Malaysian regulatory frameworks, namely the Bursa Malaysia Listing Requirements, the MCCG 2021, and the Statement on Risk Management and Internal Control: Guidelines for Directors of Listed Issuers. These sources collectively underscore the importance of transparent, meaningful, and structured risk disclosures in corporate reports. Although the regulations clearly recommend that companies provide clear and transparent information on their key risks, they stop short of prescribing exactly what should be disclosed or how such disclosures should be structured. This absence of itemized guidance leaves room for interpretation, making it necessary to operationalize these broad expectations into a more systematic and measurable scoring index.

In particular, the MCCG 2021 sets the tone by requiring companies to disclose how their key risk areas are evaluated, and the controls implemented to mitigate or manage those risks. This principle aligns with the emphasis placed on governance integration and board oversight, further promoting accountability. Bursa Malaysia's Listing Requirements, specifically Appendix 9C Paragraph 7(d), echo this sentiment by requiring disclosure of any anticipated or known risks that the group is exposed to, alongside a discussion of the strategies formulated to manage or mitigate these risks. These regulatory texts, while high-level, collectively advocate for a comprehensive and integrated approach to risk communication.

More actionable guidance is available through the Management Discussion and Analysis Disclosure Guide issued by Bursa Malaysia, which outlines more detailed expectations for risk reporting. According to the guide, disclosures should enable investors and shareholders to assess the nature and extent of risks that may impact the listed issuer's business and performance. A quality risk disclosure is expected to include the rationale for the company's exposure to certain risks, their impact on operations and financial performance, and the measures or strategies put in place to manage them. Further, forward-looking elements are encouraged, particularly the inclusion of risk trends and anticipated threats that could materially affect the company’s future performance, financial condition, or liquidity. Collectively, these expectations imply that a quality risk disclosure must be both complete and comprehensive, encompassing contextual, strategic, and forward-looking dimensions.

Although Malaysian regulatory frameworks, such as the MCCG 2021 and Bursa Malaysia Listing Requirements, promote transparency in risk disclosures, they do not specifically emphasize the inclusion of quantitative information. This stands in contrast to the Van Staden & Hooks (2007) framework, which integrates quantitative elements into its scale of disclosure quality. Nevertheless, numerous studies have demonstrated the significance of including quantitative information in corporate disclosures. For example, Studies such as Kloptchenko et al. (2004) and Dias and Matias-Fonseca (2010) show that quantitative disclosures reflect actual financial performance more accurately and can even indicate future performance when paired with narrative context. However, these insights alone are not sufficient. A balanced approach is necessary, as qualitative disclosures provide context, justification, and forward-

looking guidance that purely numerical data may lack (Crous & Van Wyk, 2021). Supporting this, Ezhilarasi and Kabra (2020) demonstrate that while both forms of disclosure matter, quantitative environmental data exerts a stronger impact on firm valuation, underscoring its critical role in financial communication.

To translate these principles into a scoring system, the KRIS-DQ Index adapts the five-point scale originally developed by Van Staden and Hooks (2007) for environmental disclosure quality, which has since been adopted by studies such as Madrigal et al. (2015) in the context of risk disclosures. The five-point scale offers a useful starting framework due to its flexibility and ability to capture both narrative and quantitative elements of disclosure. However, the scale has been adjusted to better align with the Malaysian regulatory context and expectations.

The KRIS-DQ Index was operationalised using a systematically defined content analysis protocol applied consistently across all sampled annual reports. Coding was guided by predefined operational criteria for each score level and risk category to ensure consistent application and minimise subjective interpretation.

The revised KRIS-DQ Index scoring scale is as follows: A score of 0 is assigned when there is no disclosure of the risk. A score of 1 indicates minimal coverage, characterized by vague or generic references to risk with little detail, often anecdotal or briefly mentioned without context. A score of 2 is awarded for descriptive disclosures where the impact of the risk on the group's business and performance is clearly evident, providing readers with a better understanding of the relevance and seriousness of the risk. A score of 3 is given when the disclosure goes further to explain the plans or strategies that the company has in place to mitigate or eliminate the risks discussed. Finally, a score of 4 is reserved for the most detailed disclosures, which include quantitative information, either in monetary terms or expressed as actual physical quantities, thereby enhancing the objectivity and measurability of the information presented.

The adoption of a five-level scoring scale reflects a structured progression in disclosure depth and informational richness. Rather than treating risk disclosure as a binary phenomenon, the scale captures a continuum from symbolic acknowledgment to detailed, strategy-linked, and measurable reporting. Lower scores reflect minimal or generic references to risk, while higher levels progressively incorporate articulation of impact, explanation of mitigation strategies, and ultimately quantitative specification. This progression recognises that disclosure becomes increasingly informative as it moves from vague narrative statements to specific and measurable content (Van Staden & Hooks, 2007; Kloptchenko et al., 2004). The inclusion of quantitative articulation at the highest level reflects enhanced objectivity and comparability, which prior research associates with stronger informational value (Dias & Matias-Fonseca, 2010; Ezhilarasi & Kabra, 2020). A five-level structure therefore provides sufficient granularity to distinguish meaningful variation in disclosure quality while avoiding excessive complexity that could undermine coding reliability.

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Table 5: Summary Of Scale

Score	Description
0	No disclosure
1	Minimal coverage (vague or generic references to risk with little detail)
2	Descriptive disclosures (impact of the risk is evident)
3	Explanation of mitigation strategies (plans or strategies to mitigate or eliminate the risks)
4	Inclusion of quantitative information (monetary terms or actual physical quantities)

This scoring system allows for a nuanced evaluation of the quality of key risk disclosures across Malaysian listed companies, taking into account the regulatory landscape and the practical realities of corporate reporting. By applying this five-level scale, the KRIS-DQ Index serves as both a diagnostic tool for assessing current disclosure practices and a benchmarking framework to encourage progressive enhancement in corporate transparency and governance.

Calculating KRIS-DQ Index Score

The KRIS-DQ Index will apply a weighted scoring approach where each risk category is considered equally important, and the maximum possible total mark for all disclosures is 72, calculated by multiplying the highest achievable score of 4 by the 18 key risk areas. The total marks obtained by a company are determined by summing the scores across all risk disclosures provided in the annual report. The KRIS-DQ Index score is calculated using the formula below:

$$\text{KRISDQ Index score} = \left(\frac{Total\ Marks\ Obtained}{Maximum\ Possible\ Marks\ (72)} \right) \times 100\%$$

For example, if Company A obtains a total of 54 marks from its disclosures, the KRIS-DQ Index Score is calculated as follows:

$$\text{KRISDQ Index score} = \left(\frac{54}{72} \right) \times 100\% = 75\%$$

Alternatively, if Company B achieves 36 marks, the calculation would be:

$$\text{KRISDQ Index score} = \left(\frac{36}{72} \right) \times 100\% = 50\%$$

This scoring system allows for a nuanced evaluation of the quality of key risk disclosures across Malaysian listed companies, taking into account the regulatory landscape and the practical realities of corporate reporting. It provides an effective means of assessing current disclosure practices, highlighting strengths and identifying areas for improvement. Furthermore, the KRIS-DQ Index serves as a robust benchmarking framework to encourage continuous enhancement in corporate transparency and governance. Importantly, the structured and

quantifiable nature of the index makes it a reliable and valuable tool for academic research, facilitating the measurement and comparative analysis of risk disclosure quality across various companies and industries.

Illustrative Application and Index Testing

This section presents an illustrative application of the KRIS-DQ Index to demonstrate its practical applicability and initial measurement properties. The analysis is descriptive in nature and does not involve hypothesis testing. Specifically, the section examines inter-coder reliability to assess the consistency of the KRIS-DQ coding rules, followed by descriptive diagnostics to evaluate whether the index is capable of capturing meaningful variation in key risk disclosure quality across firms and risk categories.

Inter-Coder Reliability Assessment

Inter-coder reliability was assessed using Krippendorff's alpha (α), which is widely recommended for content analysis involving multiple coders and ordinal measurement scales (Krippendorff, 2004). This measure is particularly appropriate for the KRIS-DQ Index, as the scoring rubric employs an ordered five-point scale ranging from 0 (no disclosure) to 4 (quantitative disclosure). Three independent coders analysed a subsample of 15 companies observed over a three-year period. Each annual report was evaluated across all 18 key risk categories, resulting in 270 firm-risk observations. The coding was conducted independently using the KRIS-DQ scoring guidelines, and Krippendorff's alpha was calculated using the ordinal specification to assess the level of agreement among coders. Krippendorff's alpha value obtained was 0.701, which exceeds the minimum threshold of 0.667 suggested by Krippendorff (2004) as acceptable for tentative conclusions in content analysis. This indicates an acceptable level of inter-coder agreement and provides assurance that the KRIS-DQ coding scheme can be applied consistently across analysts, thereby supporting the reliability and replicability of the index as a structured measurement tool.

Distributional Properties of KRIS-DQ Scores

Figure 1 presents the distribution of KRIS-DQ Index scores for the randomly selected sample of 100 non-financial companies, while Table 6 summarises the key descriptive statistics. The distribution exhibits a wide spread of scores, ranging from a minimum of 42 to a maximum of 70, with a mean score of 53.07 and a standard deviation of 7.83. The interquartile range, spanning from the 25th percentile (46) to the 75th percentile (60.25), further indicates meaningful dispersion across firms.

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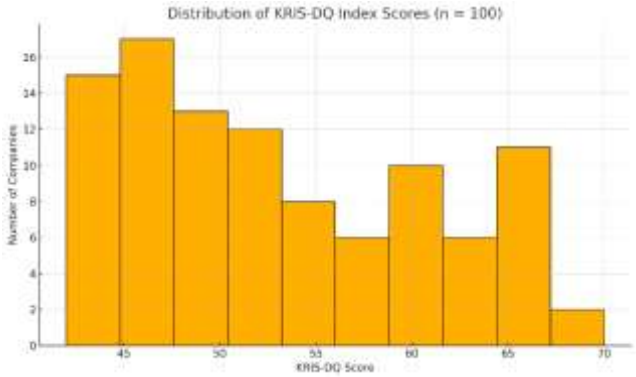

Figure 1 – Distribution Of KRIS-DQ Index Scores

The observed distribution does not display pronounced floor or ceiling effects, suggesting that the KRIS-DQ Index is capable of differentiating between firms with relatively low and high levels of key risk disclosure quality. Overall, the distributional properties provide initial evidence that the index generates sufficient variability to support comparative analysis across companies.

Table 6 – Descriptive Statistics Of KRIS-DQ Scores

Statistic	Value
Minimum	42
25th Percentile	46
Median (50th %)	52
75th Percentile	60.25
Maximum	70
Mean	53.07
Standard Deviation	7.83

Risk-Level Variation Analysis

Figure 2 illustrates the average disclosure scores across the 18 key risk categories, while Figure 3 presents a heatmap of disclosure scores by company and risk type. The results indicate noticeable variation in disclosure quality across different risk categories. Certain risks exhibit consistently higher average scores, whereas others display comparatively lower levels of disclosure.

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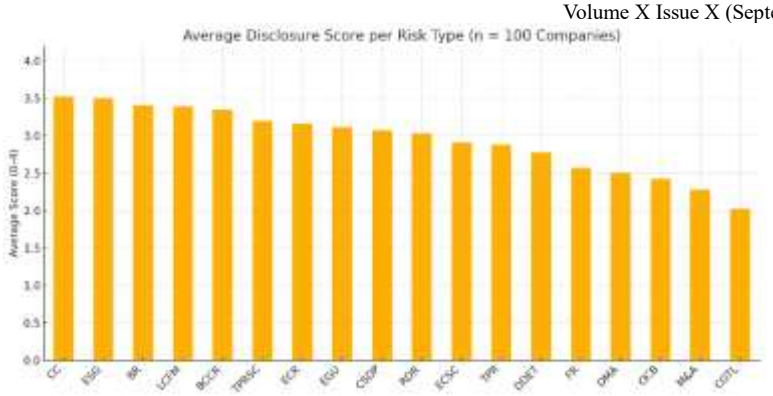

Figure 2 – Average KRIS-DQ Scores by Risk Category

The heatmap further demonstrates that disclosure quality varies not only across risk categories but also within firms, as companies tend to disclose some risks more extensively than others. This pattern suggests that the KRIS-DQ Index does not assign uniform scores mechanically across risks or firms. Instead, it captures differentiated disclosure practices that reflect variations in the treatment of specific risks within corporate reporting.

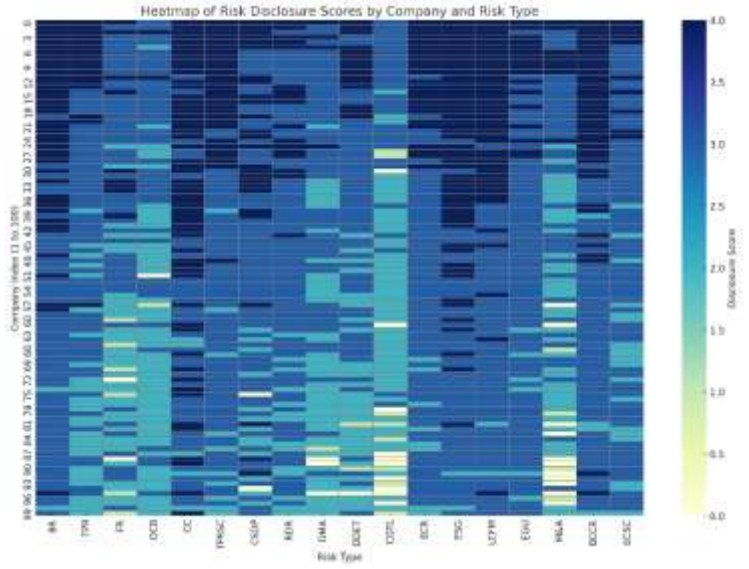

Figure 3 – Heatmap of Firm-Risk Disclosure Scores

Taken together, the risk-level analysis provides additional support for the sensitivity of the KRIS-DQ Index in capturing structured differences in key risk disclosure quality.

Conclusion

This study develops the KRIS-DQ Index as a structured approach to assessing the quality of key risk disclosures among Malaysian public-listed companies. By synthesising prior literature and aligning the measurement framework with the Malaysian regulatory environment, the index addresses longstanding limitations in existing disclosure measures that emphasise disclosure quantity rather than the quality and decision-usefulness of risk-related information. Importantly, by operationalising disclosure quality in direct reference to MCCG 2021 and Bursa Malaysia Listing Requirements, the KRIS-DQ Index also enables structured evaluation

of whether corporate risk reporting reflects substantive compliance with governance expectations rather than symbolic or boilerplate disclosure.

The KRIS-DQ Index contributes methodologically by offering a standardised and context-sensitive tool capable of capturing multiple dimensions of disclosure quality, including risk specificity, mitigation strategies, and quantitative articulation. In doing so, it enables more consistent and comparable assessment of key risk disclosures across firms and sectors, supporting both academic research and regulatory evaluation.

An illustrative application of the KRIS-DQ Index was conducted to demonstrate its practical operability and initial measurement properties. The results indicate that the index exhibits an acceptable level of inter-coder reliability, meaningful dispersion in disclosure scores, and sensitivity to variation across key risk categories. Moreover, the presence of within-firm differences in risk-level disclosure suggests that the index does not assign scores mechanically but is capable of capturing structured variation in the quality of key risk disclosures. Together, these findings provide initial empirical support for the use of the KRIS-DQ Index in future empirical studies on corporate risk disclosure.

Notwithstanding its contributions, this study is subject to certain limitations. The analysis focuses on publicly listed companies in Malaysia and relies primarily on annual report disclosures. Future research may extend the application of the KRIS-DQ Index to other institutional settings, industries, or reporting channels, as well as examine the determinants and consequences of key risk disclosure quality, including links to corporate governance characteristics and firm outcomes.

Overall, the KRIS-DQ Index provides a practical and theoretically grounded foundation for advancing research and practice in key risk disclosure. By being developed within the Malaysian institutional environment which is characterised by concentrated ownership structures and evolving enforcement intensity, the index offers particular relevance for emerging market contexts where distinguishing between symbolic compliance and substantive risk communication remains analytically important.

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