Article

Clarity in Crisis: How UK Firms Communicated Risks during COVID-19

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Abstract: This study explores the influence of risk disclosure levels and types on the readability of annual reports of non-financial firms in the UK during the COVID-19 outbreak. It further investigates how the disclosure of COVID-19-related information moderates the relationship between risk disclosure and readability. The study uses a content analysis approach and CFIE software to measure the level of risk disclosure and readability in the annual reports of non-financial firms listed on the FTSE all-share from 2019 to 2021. The results show a positive and significant effect of risk disclosure level on readability, which is stronger for firms that disclosed COVID-19 information. Different types of risk disclosure have varying effects on readability, with COVID-19 risk, credit risk, and strategic risk positively affecting readability, while operational risk negatively affects it. The study contributes to the literature on information asymmetry and institutional theory by demonstrating how risk disclosure and readability are influenced by external factors like the COVID-19 outbreak and internal factors such as firm characteristics and types of risks. It introduces a new risk definition and category specific to the COVID-19 pandemic and develops new measurements for risk disclosure, including credit, liquidity, market, operational, business, strategic, and COVID-19 risks. The study provides valuable insights for managers, investors, regulators, and standard setters on the relationship between risk disclosure and readability in annual reports. It highlights the importance of disclosing COVID-19-related information to enhance the readability and understandability of financial communication. The paper contributes to the literature and practice on risk disclosure, readability, and financial communication during crises.

Keywords: risk disclosure; COVID-19 disclosure; readability; textual analysis; information asymmetry; institutional theory

1. Introduction

COVID-19 disrupted the global economy and financial markets, causing a 3% contraction in 2020, the worst since the Great Depression (IMF 2020). The pandemic also reduced profits and output, increased uncertainty and risk aversion, and stressed the financial system. The IMF projects a $12.5 trillion loss to the world economy by 2024 due to COVID-19, as announced by its Managing Director (Reuters 2022). The crisis highlights the need for effective risk disclosure by companies, as investors demand more information about their financial health and investment risks. Companies must provide clear, accurate, and comprehensive information about their risks, mitigation plans, and COVID-19 response to demonstrate transparency and robust risk management to stakeholders and the market (Elmarzouky et al. 2021).

Risk disclosure plays a pivotal role for companies and investors. It enhances the readability of annual reports, thereby facilitating informed decisions and reducing information asymmetry. However, poor risk disclosure can lead to confusion and mistrust among users. Effective risk disclosure can reduce the cost of capital, enhance credibility, and mitigate

stock return volatility and analyst forecast dispersion (Ge and McVay 2005; Dobler 2008; Heinle and Smith 2017). It can also lessen the negative impact of asymmetrical information on reputation or financial performance (Madsen and McMullin 2020; Miihkinen 2013; Kang and Gray 2019). Furthermore, it aids in investment decision-making by reducing investor uncertainty (Elshandidy and Neri 2015). An increase in risk disclosure can positively influence a company's value, and investor expectations of future cash flows (Tan et al. 2017; Miihkinen 2013; Linsley and Shrives 2006; Kothari et al. 2009). Higher risk disclosure is associated with higher market valuation and improved operating performance (Elbannan and Elbannan 2015). It can also mitigate the impact of market momentum on the significance of a firm's risk reports (Miihkinen 2013) and help reduce the adverse effects of government safety nets (Nier and Baumann 2006). Risk disclosure is particularly beneficial for firms with limited analyst coverage, high-tech firms, and small businesses (Miihkinen 2013).

The readability of financial reports, influenced by a firm's risk-related information, impacts stakeholders' decisions. High-risk firms often disclose complex information, potentially to mask poor performance or convey negative information (Chakrabarty et al. 2018; Li 2008). Conversely, such firms may provide more comprehensible information to project transparency and decrease information asymmetry (Riley and Taylor 2014). Governance mechanisms, audit quality, and reporting standards might also affect the correlation between risk and report clarity (Prabhawa and Harymawan 2022; Bonsall and Miller 2017; Besuglov and Crasselt 2021). The complexity of the relationship between risk disclosure and readability necessitates enhanced clarity in risk disclosures (Linsley and Lawrence 2007).

This study explores the influence of risk disclosure levels and types on the readability of annual reports of non-financial firms in the UK during the COVID-19 pandemic, investigating how the disclosure of COVID-19-related information moderates the relationship between risk disclosure and readability. Employing a content analysis approach, the research provides insights into how firms communicate risks in times of crisis. Addressing the research gap on risk disclosure's impact on readability among non-financial FTSE All Share firms from 2019 to 2021, this study introduces a unique risk definition, measurement, category, and disclosure metric for the pandemic period. It employs the Information Asymmetry Theory (Akerlof 1978; Healy and Palepu 2001) and the Institutional Theory (DiMaggio and Powell 1983; Scott 1995; Meyer and Rowan 1977) to clarify the link between risk disclosure and readability, highlighting the role of disclosure in reducing information asymmetry and adhering to institutional pressures during complex risks like COVID-19.

The UK, severely impacted by COVID-19, with over 4.5 million cases and 128,000 deaths as of June 2021 (GOV.UK 2021), was chosen for this study due to several unique factors that distinguish it from other developed countries. First, the UK's regulatory environment is characterized by stringent financial reporting standards and governance frameworks, including the UK Corporate Governance Code and the UK Companies Act. These regulations mandate high levels of transparency and risk disclosure, making the UK an ideal setting to analyze how firms communicate risks during a crisis. Furthermore, the UK's recent exit from the European Union (Brexit) has created a distinct economic and regulatory environment. Companies operating in the UK are navigating new trade agreements, regulations, and economic uncertainties, which have significantly influenced their risk disclosure practices. This ongoing adjustment to a major geopolitical shift presents a valuable opportunity to investigate how firms adapt their communication strategies in response to such profound changes.

The UK's emphasis on the Stewardship Code—a voluntary code for institutional investors—encourages engagement between investors and companies on long-term issues, including risk management. The influence of this code on risk disclosure practices is a unique aspect of the UK's corporate landscape, further justifying its selection as the focus of this study. The UK's diverse economy, encompassing a wide range of non-financial firms across sectors like healthcare, technology, and retail, offers a representative sample

for examining risk disclosure practices. This diversity, coupled with the UK's status as a global financial hub, ensures that the findings of this study have broader implications, potentially informing risk disclosure practices in other international contexts. Finally, the UK's historical experience in navigating financial crises, such as the 2008 financial crash and Brexit, has cultivated a heightened awareness and responsiveness to risk management among firms. This background provides a rich context for understanding the dynamics of risk disclosure during the unprecedented challenges of the COVID-19 pandemic. By focusing on the UK, this study seeks to offer new insights into the interplay between risk disclosure and readability, particularly within the context of the unique challenges presented by the COVID-19 pandemic.

To explore these relationships, the study employs a content analysis approach using CFIE software to assess the level of risk disclosure and readability in the annual reports of non-financial firms listed on the FTSE All-Share from 2019 to 2021. This period captures the critical phases before, during, and after the COVID-19 pandemic, allowing for a comprehensive analysis of how firms adapted their communication strategies in response to the crisis. The methodology involves developing a detailed risk disclosure index and applying regression models to test the impact of various risk disclosure types on readability, with a particular focus on the moderating role of COVID-19-related disclosures.

This study reveals a positive interaction between a firm's risk-related information and readability, with firm size and profitability positively impacting readability, while board size negatively impacts readability. The interaction between risk disclosure level and COVID-19 disclosure is significantly positive, indicating a stronger effect on readability for firms that disclosed COVID-19 information. The study examines the effects of different types of risk disclosure on readability, with COVID-19 risk, credit risk, and strategic risk positively affecting readability, while operational risk negatively affects it.

The paper elucidates the implications of these findings for both theory and practice. Theoretically, the study advances the literature by elucidating the interplay between risk disclosure, readability, and the COVID-19 pandemic. Theoretically, it extends the understanding of information asymmetry and institutional theory by demonstrating how both external factors, such as the COVID-19 outbreak, and internal factors, including firm characteristics and types of risks, influence risk disclosure and readability. By introducing a new risk definition and category specific to the COVID-19 pandemic, the study enhances existing theoretical frameworks and provides a basis for future research. Furthermore, it develops novel measurements for risk disclosure, encompassing credit, liquidity, market, operational, business, strategic, and COVID-19 risks, thereby advancing methodological approaches in the field. Methodologically, the introduction of a specific COVID-19 risk category contributes to future research by offering a framework that can be utilized in subsequent studies. The findings also provide practical insights for managers, investors, regulators, and standard setters on improving risk disclosure and readability during crises. By emphasizing the importance of clear and comprehensive risk disclosures, the study highlights how firms can enhance stakeholder trust and facilitate informed decision-making. Practically, the paper offers insights on improving risk disclosure and readability during crises. It finds that risk disclosure enhances readability, with COVID-19 risk, credit risk, operational risk, and strategic risk having the most impact. The paper emphasizes the importance of disclosing COVID-19-related information and suggests that firms should disclose the most relevant risks. It also highlights the role of regulators and standard setters in enforcing plain English and risk disclosure regulations. The paper contributes to the literature and practice on risk disclosure, readability, and financial communication during crises, providing valuable insights for firms, investors, and regulators.

This paper is organized into five sections. Section 2 provides the Literature Review, Theoretical Framework, and hypothesis development for the study. Section 3 details the research methodology used. Section 4 presents the empirical results of the study. Section 5 details discussion, and finally, the fifth section provides conclusions and suggestions for future research.

2. Literature Review, Theoretical Framework, and Hypothesis Development

2.1. Risk Disclosure in the COVID-19 Outbreak

Risk is a complex concept that has various definitions and classifications depending on the perspective and context (Schrand and Elliott 1998; Cabedo and Tirado 2004; Horcher 2005; Institute of Chartered Accountants in England and Wales 2016). For the purpose of this study, risk is defined as "a measurable outcome or probability of future events resulting from the interaction of internal and external factors affecting a firm's wealth and value." Risk disclosure is "the communication of information concerning risks or anything that may lead to risks to the users of financial statements". Risk disclosure can be categorized into three types: COVID-19-related risk disclosure, financial, and non-financial risk disclosure. COVID-19 risk disclosure provides information on potential harm from the SARS-CoV2 virus and pandemic, including public health, economic, and societal risks (Deloitte 2020; Elmarzouky et al. 2021). Financial risk disclosure communicates potential financial losses impacting financial assets and obligations, such as credit, liquidity, market, and operational risk (Cabedo and Tirado 2004). Non-financial risk disclosure communicates risks leading to cash flow losses, like strategic and business risks not linked to financial performance (Cabedo and Tirado 2004). A comprehensive understanding of these risks and disclosures is crucial for evaluating a company's risk profile and making informed decisions, contingent on clear and concise communication.

2.2. The Usefulness of Risk Disclosure

Over the years, numerous studies have highlighted the benefits of risk disclosure, including capital cost reduction, information asymmetry mitigation, investment decision-making enhancement, risk disclosure quality improvement, and market impact reduction. These benefits positively influence a company's financial performance, including operating performance, market valuation, and overall value.

One significant advantage of risk disclosure is the reduction in capital costs. By providing investors with valuable risk information, improving their understanding of a company's financial situation, reducing capital costs (Ge and McVay 2005; Dobler 2008; Heinle and Smith 2017), increasing credibility, and decreasing stock return volatility and analyst forecast dispersion (Ge and McVay 2005). Also, risk disclosure plays a crucial role in mitigating information asymmetry. Publicly available risk information can help reduce agency costs (Miihkinen 2013) and mitigate the negative impacts of asymmetrical information on reputation or financial performance (Madsen and McMullin 2020; Miihkinen 2013; Kang and Gray 2019). Furthermore, effective risk disclosure enhances investment decision-making. By reducing investor uncertainty (Elshandidy and Neri 2015), providing hazard transparency (Campbell et al. 2014), and facilitating informed investment decision-making. Increased risk disclosure can positively impact a company's overall value and influence investor expectations of future cash flows (Tan et al. 2017; Miihkinen 2013; Linsley and Shrives 2006; Kothari et al. 2009). Moreover, the quality of risk disclosure can be enhanced through increased specificity (Hope et al. 2016) and improved perceived value of auditor services (Fukukawa and Kim 2017). Higher risk disclosure is associated with higher market valuation and improved operating performance (Elbannan and Elbannan 2015). Lastly, risk disclosure helps mitigate market impacts. It reduces the influence of market momentum on the significance of a firm's risk reports (Miihkinen 2013) and helps reduce the adverse effects of government safety nets (Nier and Baumann 2006). This is particularly beneficial for firms with limited analyst coverage, high-tech firms, and small businesses (Miihkinen 2013).

2.3. Risk Disclosure, Readability, and COVID-19

The readability of financial reports affects the decision-making of various stakeholders, such as investors, auditors, and regulators. However, previous studies have reported inconsistent results on the impact of the firm's risk-related information on readability. The intricate relationship between risk disclosure and the readability of financial reports remains

an unresolved issue. Research by Chakrabarty et al. (2018) and Li (2008) indicates that firms with higher risk profiles often disclose information that is complex and challenging to understand. Such complexity can serve to mask poor performance, avert litigation, facilitate actions that destroy value, or convey negative information.

On the other hand, some research, such as that by Riley and Taylor (2014), suggests that high-risk firms may provide more comprehensible information to project transparency and credibility or to decrease information asymmetry and agency costs. They posited that nonprofessional investors could benefit from risk disclosures written in plain English. However, other studies like those by Prabhawa and Harymawan (2022), Bonsall and Miller (2017), and Besuglov and Crasselt (2021) propose that factors such as governance mechanisms, audit quality, and reporting standards might also affect the correlation between risk and report clarity. Linsley and Lawrence (2007) found the risk disclosures in annual reports to be challenging to understand, implying a need for directors to enhance clarity. This highlights the complexity of the relationship between risk disclosure and readability, warranting further investigation.

Recent studies have shown that the independence of a board plays a significant role in enhancing the readability of annual reports. Independent boards are more likely to ensure that financial reports are clear and transparent, thereby improving readability and overall information quality (Rahman and Kabir 2023). The readability of financial reports has a direct impact on corporate behavior, particularly in the banking sector. Riley and Taylor (2014) provide a notable study on the relationship between risk disclosure and readability. They find that firms with more comprehensive risk disclosures tend to have more readable annual reports, positing that plain English in communicating risks can improve stakeholder comprehension and decision-making. This indicates that transparency and clarity in risk reporting have the potential to enable more informed judgments. However, as the authors note, the influence of risk information on readability remains an intriguing area for further research. This emphasizes the multifaceted association between risk disclosure and annual report readability, highlighting a need for ongoing investigation. Improved readability of risk disclosures in financial documents, such as bond prospectuses, has been shown to reduce credit risk premiums. Clearer disclosures enable investors to better assess risks, leading to lower perceived risk and, consequently, a lower credit risk premium (Yao et al. 2024).

Based on this Theory and the previous studies, we hypothesize that:

H1: *Firms with higher levels of risk disclosure have more readable annual reports.*

The Institutional Theory (DiMaggio and Powell 1983; Scott 1995; Meyer and Rowan 1977) suggests firms conform to institutional pressures for legitimacy, amplified by COVID-19 risks. These pressures, including norms, values, and expectations, influence firm behavior. Firms seek legitimacy, enhancing survival and performance, especially during crises. The COVID-19 pandemic has introduced new institutional pressures due to increased global uncertainty, volatility, and complexity. It has also heightened stakeholder demand for transparency and disclosure. Firms are expected to disclose their response to the pandemic and how they manage its risks and impacts. This voluntary COVID-19 disclosure signals firm preparedness, demonstrating social responsibility and accountability. It can enhance firm legitimacy, reputation, and stakeholder communication.

Previous studies have examined the relationship between risk disclosure and readability. Riley and Taylor (2014) found that firms that disclose risks more extensively have annual reports that are easier to read, implying that using simple language to convey risks can enhance stakeholder understanding and decision-making. This suggests that risk reporting that is transparent and clear can facilitate more informed judgments. However, they also acknowledge that the impact of risk information on readability is a fascinating topic for further research (Riley and Taylor 2014). This emphasizes the complex relationship between risk disclosure and annual report readability, indicating a need for continued investigation.

Elmarzouky et al. (2021) extend this line of inquiry by examining the effect of COVID-19 disclosure on uncertainty in annual reports. They find that there is a positive relationship between COVID-19 disclosure and uncertainty, suggesting that firms use COVID-19 disclosure to cope with the increased ambiguity and unpredictability caused by the pandemic. Based on the Institutional Theory and the previous studies, we hypothesize that:

H2: *The positive relationship between risk disclosure and readability is stronger for firms that disclosed COVID-19-related information.*

As we delve deeper into this topic, it becomes evident that the influence of a firm's risk-related information on the comprehensibility of financial reports remains an open research question, particularly in the context of global crises such as COVID-19. This study integrates the Information Asymmetry and Institutional Theories to explore the relationship between risk disclosure and readability during the COVID-19 outbreak. Asymmetry Theory, as developed by Akerlof (1978), and Healy and Palepu (2001), emphasizes the role of voluntary disclosure in bridging the information gap between firm managers and external users, thereby enhancing transparency. This theory suggests that risk disclosure can mitigate the adverse effects of information asymmetry—such as adverse selection and moral hazard—by providing valuable insights into potential outcomes and the probabilities of future events affecting a firm's wealth and value. Improved transparency through risk disclosure can reduce uncertainty and increase trust in the firm, thereby facilitating more informed decision-making by external users. However, readability, which is essential for comprehension, plays a crucial role in determining how effectively this disclosed information is received and interpreted by stakeholders. Depending on text clarity and complexity, readability can either enhance or impair the effectiveness of risk disclosures. Having developed our hypotheses based on the theoretical framework, we now turn to the research gap and the purpose of our study: to examine the effect of risk reporting on readability in the context of the COVID-19 pandemic. Despite the extensive literature on risk disclosure and its acknowledged benefits, a significant gap persists in understanding how different types of risk disclosures influence the readability of financial reports during a global crisis like COVID-19. While prior research has extensively explored the relationship between risk disclosure and various corporate outcomes—such as financial performance, market reactions, and investor behavior—it has largely overlooked the specific impact of risk disclosure on the readability of annual reports during major crises. This study seeks to address this deficiency by providing empirical evidence on the interplay between risk disclosure, readability, and the moderating role of COVID-19 disclosure. The pandemic has introduced new and complex risks, profoundly affecting the global economy and business operations. Consequently, there is a pressing need for empirical evidence on how firms communicate and evaluate risk information in this unprecedented environment. By focusing on this underexplored area, our research aims to offer novel insights into the relationship between risk disclosure and readability, thereby contributing to a deeper understanding of financial reporting in times of crisis.

3. Methodology

3.1. Sample Selection and Data Collection

The study utilized a sample consisting of 353 non-financial companies listed on the UK FTSE-All Share during the fiscal years of 2019 to 2021. The period from 2019 to 2021 was selected for this study due to its critical relevance to the COVID-19 pandemic and its profound impact on global economies and financial reporting practices. This timeframe encompasses pre-pandemic conditions, the peak of the crisis, and the early recovery stages, allowing for a comprehensive analysis of how firms adapted their risk disclosure practices in response to the unprecedented challenges posed by COVID-19. The year 2019 serves as a baseline, capturing the state of risk disclosure prior to the pandemic, while the subsequent years, 2020 and 2021, represent the height of the crisis, during

which firms faced significant pressure to enhance their risk communication strategies. This selection facilitates an in-depth examination of how the pandemic influenced risk disclosure practices and the readability of annual reports among non-financial firms listed on the FTSE All-Share. The study employs data from this period to capture the initial and most impactful phase of the pandemic, providing valuable insights into the interplay between risk disclosure, readability, and the evolving regulatory landscape. The UK's robust regulatory framework, Brexit-induced economic shifts, investor-focused governance, and historical crisis experience render it an optimal context for analyzing the interplay between risk disclosure and readability during the COVID-19 pandemic. These factors provide a representative sample for exploring differences and similarities among firms. The research utilized annual reports from the chosen firms, which were procured from their online websites and analyzed using automated content analysis techniques and a software program known as CFIE, which was developed by Lancaster University. This methodology entailed extracting relevant narrative information related to risk disclosure and scoring and analyzing these disclosures using the CFIE software. The information for companies listed on the FTSE All-share was collected from the Bloomberg database, while the financial data were obtained from the Eikon database.

3.2. Variable Coding and Measurement
3.2.1. Development of the Risk Disclosure Index

The risk disclosure index was meticulously developed through a systematic and multi-faceted approach, incorporating insights derived from both the academic literature and empirical data. The study employed a self-constructed disclosure index (Table 1) and adopted a content analysis methodology to assess risk disclosure levels across a range of categories: COVID-19, credit risk, operational risk, liquidity risk, market risk, strategic risk, and business risk. The creation of the risk disclosure wordlist entailed an exhaustive review of pertinent literature combined with an empirical analysis of corporate reports, encompassing both financial and non-financial risks as well as specific terminologies related to COVID-19. This rigorous methodology ensured the index's robustness and accuracy in evaluating risk disclosures.

Table 1. Risk disclosure index.

Panel A		Panel B	
COVID-19 Related information		Financial Risk Disclosure:	
Corona	Quarantine	Operational Risks	Market Risks
Contagion	Super-spreader	Fraud	Foreign Exchange
Outbreak	Death	Fault	Interest
COVID#	Disaster	Mistake	Fair value
Social distancing	Havoc	Defect	Commodity price
SARS-CoV-2	Destruction	Dilemma	Volatility
Spread	Crisis	Challenge	Collapse
Epidemic	Toxin	Weakness	Shortage
Pandemic#	Infection	Impairment	Fluctuation
Hand wash	Victim	Dissatisfaction	Variation
Facemask	Damage	Unsatisfactory	Pricing
Redundancy	Severity	Unable	Credit Risks
Safety measures	Serious	Loss	Gearing
Working online	Accident	Shrinkage	Insolvency

Table 1. *Cont.*

Working from home	Harm	Troubles	Bankruptcy
Herd immunity	Suffer	Contingency	Failure
Lockdown	Self-isolation	Failure	Variation
Vaccine		Scarcity	Change
		Liquidity Risks	Insufficiency
		Shortage	Deficit
		Not trading	Evade
		Frequency	
		Distress	

Panel C

Non-Financial Risk disclosure:

Business risk disclosure		Strategic risk disclosure	
Corruption	Insecure	Competence	Uncertain
Misuse	Conflict	Revolution	Struggle
Collapse	Violate	Coup	Emergency
Exposure	Steal	Violence	Deficiency
Danger	Theft	Instability	Shock
Threat	FALSE	Protests	Strikes
Hazard	fire	Terrorism	Float
Harm	Damage	War	Incidents
Loss	Victim	Collapse	Laws
Fault	Fraud	Conflict	Political
Mistake	Cheat	Damage	Environment
Hack	Deceive	Lawsuit	Disaster
Attack	Fake		
Crack	Corruption		
Spyware	Crime		
Virus	Lawsuits		
Cheat	Litigation		

The development of the risk disclosure index began with a comprehensive literature review, which established the theoretical foundation and identified key categories of risk disclosure. Following this, an exploratory analysis of a random sample of UK corporate annual reports was conducted to assess the scope and variety of risk disclosures. This investigation refined the risk disclosure categories by identifying common themes and practices among UK firms. A broad set of keywords related to risk disclosure was identified, including synonyms, to ensure comprehensive coverage. These keywords were filtered based on their frequency and relevance in the annual reports, resulting in a focused and representative wordlist. The wordlist was further refined to include COVID-19 disclosures, guided by the World Health Organization (WHO) and other relevant sources, encompassing both financial and non-financial risks. Moreover, two- and three-word phrases were developed to improve the robustness of the disclosure quality, as recommended in existing literature. The NVivo 12 Pro software was employed to systematically analyze the annual reports of non-financial firms listed on the FTSE All-Share index, identifying the most frequently used terms associated with risk disclosure. Subsequently, LancsBox

software 5.0.1 was utilized to trace these keywords within the text, ensuring that at least 75% of relevant disclosures were captured. Independent analyses were conducted by the researchers, followed by a consensus process to finalize the keyword list, ensuring both accuracy and comprehensiveness. Finally, CFIE software was used to score the reports by processing the wordlists and organizing the results for further analysis. This systematic approach enabled a detailed assessment of risk disclosure across various categories. The index is presented in Table 1 below.

3.2.2. Measuring Readability

Readability is the ease of reading and understanding a text, which depends on various factors, such as word and sentence length and complexity, punctuation and formatting, and content clarity and coherence (Loughran and McDonald 2014). Readability influences the communication and transparency between the writer and the reader, and the information transfer effectiveness and efficiency. Therefore, readability is a key aspect of the annual reports quality and usefulness, as it affects the stakeholders' decision-making and behavior. This research employed CFIE software to conduct an automatic assessment of readability. The Flesch Reading Ease score, which spans from 0 to 100, indicates that higher scores correlate with greater readability.

3.2.3. Control Variables

Our regression models include various control variables to examine the relationship between risk disclosure and readability and the effect of COVID-19 disclosure on this relationship. The control variables are defined in Table 2.

Table 2. Control variables measurements:.

Variable	Symbol	Definitions and Measurements
Firm Size	FSIZE	Logarithm of the company's total assets (Moussa and Elmarzouky 2024a)
Liquidity	LIQ	Evaluated through the current ratio, which demonstrates the company's capacity to fulfill immediate financial obligations using its current assets (Moussa and Elmarzouky 2024b)
Profitability	ROA, ROE	Expressed by both return on assets (ROA) and return on equity (ROE), these metrics mirror the financial performance of the company (Moussa and Elmarzouky 2023; Giannopoulos et al. 2022)
Leverage	LEV	Measured by the debt-to-equity ratio, indicating the company's reliance on debt financing (Moussa 2024)
Board Size	BSIZE	Quantity of board members (Endrikat et al. 2021)
Independent Board	INDB	Percentage of board members with no ties to company management or significant shareholders (Endrikat et al. 2021)
Audit Committee Non-Executives	ACNEX	Inclusion of non-executive members in the firm's audit committee, free from company management influence
Audit Committee Independence	ACIND	Proportion of independent directors on the company's audit committee

3.3. Empirical Models and Econometric Techniques

We use regression to test the effect of Risk Disclosure Level (RDL) on readability and the moderating role of COVID-19 disclosure. The models used in this study are as follows:
The First model:

$$\text{Flesch} = \beta_0 + \beta_1 \text{RDL} + \beta_2 \text{FSIZE} + \beta_3 \text{LIQ} + \beta_4 \text{ROA} + \beta_5 \text{LEV} + \beta_6 \text{BSIZE} + \beta_7 \text{INDB} + \beta_8 \text{ACNEX} + \beta_9 \text{ACIND} + \varepsilon$$

The second model:

$$\text{Flesch} = \beta_0 + \beta_1 \text{RDL} + \beta_2 (\text{C.RDL\#C.COVID}) + \beta_3 \text{FSIZE} + \beta_4 \text{LIQ} + \beta_5 \text{ROA} + \beta_6 \text{LEV} + \beta_7 \text{BSIZE} + \beta_8 \text{INDB} + \beta_9 \text{ACNEX} + \beta_{10} \text{ACIND} + \varepsilon$$

In the first model, Flesch reading ease score is the outcome variable, with Risk Disclosure Level (RDL) as the main predictor. Control variables include firm size (FSIZE), liquidity (LIQ), profitability (ROA), leverage (LEV), board size (BSIZE), independent board (INDB), audit committee non-executives (ACNEX), and audit committee independence (ACIND).

The second model adds an interaction term (C.RDL#C.COVID) to capture the moderating effect of COVID-19 disclosure on the relationship between RDL and Flesch. The control variables remain the same as in the first model. Both models have limitations in capturing specific variations in Flesch, represented by the error term (ε).

4. Empirical Results

4.1. Descriptive Statistics

Table 3 presents the descriptive statistics summarizing the variables used in the study. Panel A summarizes the descriptive statistics for the variables utilized in this study, providing insights into their central tendencies and dispersions. The readability scores exhibit a minimum of 0 and a maximum of 58.979, with a mean of 18.629, indicating a wide range of readability across the reports analyzed. The risk disclosure level (RDL) shows significant variation, with a minimum of 0, a maximum of 2919, and an average score of 310.703. Regarding control variables, firm size ranges from 11.426 to 17.501 with a mean of 13.909. Liquidity ranges from 0.14 to 20.91 with a mean of 1.644. Profitability varies from −0.853 to 0.345, with a mean of 0.04. Leverage ranges from 0 to 0.849, averaging at 0.178, while board size ranges from 3 to 12 with a mean of 7.528. Independent board representation ranges from 17.65 to 100 with a mean of 67.546, and audit committee non-executives range from 20 to 100 with a mean of 98.021. Audit committee independence spans from 33.33 to 100 with a mean of 93.475.

Table 3. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
			Panel A		
Flesch	730	18.629	24.619	0	58.979
RDL	1966	310.703	472.067	0	2919
FSIZE	1795	13.909	1.591	11.426	17.501
LIQ	822	1.644	1.37	0.14	20.91
ROA	1481	0.04	0.102	−0.853	0.345
LEV	1474	0.178	0.171	0	0.849
BSIZE	1969	7.528	2.43	3	12
INDB	1041	67.546	18.44	17.65	100
ACNEX	1011	98.021	6.873	20	100
ACIND	1024	93.475	12.923	33.33	100
			Panel B		
Variable	Obs	Mean	Std. Dev.	Min	Max
COVID	737	153.488	147.23	0	859
CRRD	737	97.126	53.534	0	400
OPRD	737	197.958	99.78	4	666
LIQRD	737	4.38	5.264	0	36
MRRD	737	230.783	116.338	0	874
STGRD	737	89.687	47.967	3	328
BUSRD	737	55.402	52.212	0	395

In addition to these variables, Panel B summarizes the descriptive statistics for various risk disclosure categories, providing further insights into their levels during the study period. The COVID-19 risk disclosure scores range from a minimum of 0 to a maximum of 859, with a mean score of 147.23, indicating varying levels of disclosure among firms regarding pandemic-related risks. Credit risk disclosure ranges from 0 to 400, with a mean of 97.126, while operational risk scores range from 4 to 666, averaging at 197.958. Liquidity

risk scores vary from 0 to 36, yielding a mean of just 4.38, and market risk scores range from 0 to 874, with a mean score of 230.783. Strategic risk disclosure shows a range from 3 to 328, averaging at 89.687, whereas business risk scores range from 0 to 395 with a mean of 55.402.

4.2. Pairwise Correlations

The pairwise correlations, displayed in Table 4, show the strength and direction of the linear relationship between each pair of variables used in the study. These correlations indicate the degree of association and the potential multicollinearity among the variables. The pairwise correlations reveal that the readability (Flesch) has a moderate positive correlation with the risk disclosure level (RDL) and the firm size (FSIZE), meaning that these variables tend to increase or decrease together. The readability has a weak positive correlation with the board size (BSIZE) and the independent board (INDB), meaning that these variables have a slight positive relationship. The readability has a weak negative correlation with the liquidity (LIQ), the profitability (ROA), the leverage (LEV), the audit committee non-executives (ACNEX), and the audit committee independence (ACIND), meaning that these variables tend to move in opposite directions. The pairwise correlations provide a preliminary analysis of the data set and its relationships.

Table 4. Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	VIF
(1) Flesch	1.000										2.249
(2) RDL	0.340 *	1.000									1.722
(3) FSIZE	0.268 *	0.362 *	1.000								1.626
(4) LIQ	−0.009	−0.058 *	−0.115 *	1.000							1.581
(5) ROA	−0.005	0.040	−0.132 *	0.195 *	1.000						1.564
(6) LEV	−0.028	0.276 *	0.288 *	−0.231 *	−0.145 *	1.000					1.19
(7) BSIZE	0.310 *	0.246 *	0.572 *	−0.550	−0.450 *	0.386 *	1.000				1.162
(8) INDB	0.061	−0.290 *	0.082 *	−0.021	−0.015	−0.193 *	−0.261 *	1.000			1.137
(9) ACNEX	−0.047	−0.044	0.087 *	0.064	0.010	−0.026	−0.037	0.156 *	1.000		1.117
(10) ACIND	−0.022	−0.092 *	0.139 *	0.031	0.013	−0.022	0.037	0.460 *	0.296 *	1.000	1.483

Standard errors in parentheses. * $p < 0.1$; the table presents the correlation matrix.

The weak relationship between the independent and control variables suggests that there is no significant multicollinearity in the data. This conclusion was supported by the calculation of variance inflation factors (VIF), and as none of the VIF values exceeded the threshold, it confirms that there is no presence of multicollinearity.

4.3. Multivariate Analysis

Table 5 shows the results of the OLS, random, and Tobit regression analyses of the impact of RDL on the readability of the annual reports of non-financial firms listed on the FTSE All Shares index. The justification for our choice of regression models is rooted in the panel data nature of our data set. We utilize ordinary least squares (OLS) regression to explore the relationships between variables. We have conducted preliminary tests to ensure our data meet the assumptions required for Ordinary Least Squares (OLS) regression, including normality and linearity. We also performed the Hausman specification test to identify the most suitable model. The results yielded a chi-square value of 1.002 and a *p*-value of 0.998, indicating no significant difference between the fixed and random effects models. Consequently, we determined that the random effects model is the most appropriate for our analysis, as it offers more efficient estimates and accommodates time-invariant variables. We employed Tobit regression because our dependent variable is non-negative and restricted to positive values, allowing us to account for the censoring of values at zero. The results indicate that RDL and readability have a positive and significant relationship at a 5% significance level in all models, suggesting that firms that provide more detailed information about their risks have higher readability scores, meaning that their annual reports are easier to read and understand. The results are consistent across all models, indicating the robustness of the findings. The results also show that some of

the control variables have a significant impact on readability. Firm size and profitability have a positive and significant relationship with it, meaning that larger and more profitable firms have higher readability scores. Board size has a negative and significant relationship with it, meaning that firms with larger boards have lower readability scores. The other control variables have no significant relationship with readability, meaning that they do not affect this measure. The results support the hypothesis that firms with higher levels of risk disclosure have more readable annual reports, and provide evidence for the applicability and relevance of the Information Asymmetry Theory (Akerlof 1978; Healy and Palepu 2001). This theory suggests that firms disclose more information to reduce the information gap between managers and investors and to signal their quality and performance. Table 5 confirms this hypothesis, as it indicates that firms that disclose more information about their risks have higher readability scores, which means that their annual reports are easier to read and understand. This finding implies that firms use risk disclosure as a signaling mechanism to communicate their risks more clearly and transparently to their stakeholders, enhancing their credibility and facilitating informed decision-making. Our result is also in line with the existing literature on risk disclosure and information asymmetry. For instance, Riley and Taylor (2014) found that firms that disclose risks more extensively have annual reports that are easier to read, implying that using simple language to convey risks can enhance stakeholder understanding and decision-making. This suggests that risk reporting that is transparent and clear can facilitate more informed judgments. However, they also acknowledge that the impact of risk information on readability is a fascinating topic for further research.

Table 5. The effect of RDL on Readability.

	OLS	Random	Tobit
Variables	**Flesch**	**Flesch**	**Flesch**
RDL	0.717 **	0.717 **	0.717 **
	(0.389)	(0.389)	(0.385)
FSIZE	0.416 **	0.416 **	0.416 **
	(1.227)	(1.227)	(1.213)
LIQ	−0.182	−0.182	−0.182
	(1.146)	(1.146)	(1.133)
ROA	13.50 **	13.50 **	13.50 **
	(16.14)	(16.14)	(15.97)
LEV	−7.600	−7.600	−7.600
	(8.676)	(8.676)	(8.580)
BSIZE	−0.783 **	−0.783 **	−0.783 **
	(0.823)	(0.823)	(0.813)
INDB	0.138	0.138	0.138
	(0.122)	(0.122)	(0.121)
ACNEX	−0.115	−0.115	−0.115
	(0.164)	(0.164)	(0.162)
ACIND	−0.128	−0.128	−0.128
	(0.111)	(0.111)	(0.110)
Constant	30.71	30.71	30.71
	(19.24)	(19.24)	(19.02)
Observations	453	453	453
R-squared	0.022		
Number of Year		3	

Standard errors in parentheses. ** $p < 0.05$.

4.4. Moderating Effect of COVID-19 Disclosure

The regression analysis results, presented in Table 6, demonstrate the moderating effect of COVID-19 disclosure on the relationship between risk disclosure level and readability of annual reports from non-financial firms listed on the FTSE All Shares index. These results suggest that firms providing detailed information about their risks and COVID-19 impacts

achieve higher readability scores, indicating their annual reports are more comprehensible. The analysis also reveals that control variables like firm size, profitability, and board size significantly affect readability. However, variables such as liquidity, leverage, industry dummy, audit committee expertise, and audit committee independence do not significantly impact readability.

Table 6. Moderating effect of COVID-19 disclosure on the relationship between RDL and readability.

Variables	OLS	Random	Tobit
	Flesch	Flesch	Flesch
C.RDL#C.COVID	5.89 ***	5.89 ***	5.89 ***
	(5.59)	(5.59)	(5.52)
FSIZE	0.998 **	0.998 **	0.998 **
	(1.182)	(1.182)	(1.169)
LIQ	−0.0388	−0.0388	−0.0388
	(1.361)	(1.361)	(1.346)
ROA	17.97 **	17.97 **	17.97 **
	(16.73)	(16.73)	(16.54)
LEV	−7.900	−7.900	−7.900
	(9.137)	(9.137)	(9.034)
BSIZE	−0.618 **	−0.618 **	−0.618 **
	(0.831)	(0.831)	(0.822)
INDB	0.151	0.151	0.151
	(0.124)	(0.124)	(0.123)
ACNEX	−0.113	−0.113	−0.113
	(0.166)	(0.166)	(0.164)
ACIND	−0.134	−0.134	−0.134
	(0.113)	(0.113)	(0.112)
Constant	25.90	25.90	25.90
	(19.31)	(19.31)	(19.09)
Observations	444	444	444
R-squared	0.018		
Number of Year		3	

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$.

Our study confirms the hypothesis that the positive relationship between risk disclosure and readability is stronger for firms that disclosed COVID-19-related information. This implies that firms disclosing more COVID-19 information were more responsive to the increased demand for transparent reporting during the pandemic, signaling their awareness and preparedness to stakeholders. However, such reporting may introduce complexity and uncertainty, emphasizing the importance of readability and clarity. The significant moderating effect of COVID-19 disclosure supports the applicability of the Institutional Theory (DiMaggio and Powell 1983; Scott 1995; Meyer and Rowan 1977), suggesting firms conform to their institutional environment's norms and expectations, adopting similar practices to gain legitimacy and support.

These results align with the existing literature, such as Riley and Taylor (2014), who found that firms disclosing risks more extensively produce easier-to-read annual reports. This suggests transparent and clear risk reporting can facilitate more informed judgments. Elmarzouky et al. (2021) extend this inquiry by examining the effect of COVID-19 reporting on uncertainty in annual reports, finding a positive relationship, indicating firms use COVID-19 reporting to cope with the pandemic's increased ambiguity and unpredictability. However, the impact of risk information on readability warrants further research.

4.5. Robustness Check

The robustness check of this study's findings replaced the profitability variable (ROA) with another common measure, return on equity (ROE), and recalculated the multivariate regression models following (Moussa and Elmarzouky 2023). Table 7 presents the

results of this check, confirming a consistent and significant effect of the interaction term "C.RDL#C.COVID" on readability score at 5% across all four regression models (OLS, random effects, and Tobit). This indicates that firms providing detailed risk and COVID-19 information tend to have higher readability scores, suggesting their annual reports are more comprehensible.

Table 7. Robustness check.

	OLS	Random	Tobit
Variables	**Flesch**	**Flesch**	**Flesch**
C.RDL#C.COVID	7.15 **	7.15 **	7.15 **
	(5.75)	(5.75)	(5.68)
FSIZE	1.313 **	1.313 **	1.313 **
	(1.190)	(1.190)	(1.176)
LIQ	−0.286	−0.286	−0.286
	(1.358)	(1.358)	(1.342)
ROE	17.15 **	17.15 **	17.15 **
	(19.07)	(19.07)	(18.84)
LEV	−10.10	−10.10	−10.10
	(9.737)	(9.737)	(9.623)
BSIZE	−0.762 **	−0.762 **	−0.762 **
	(0.853)	(0.853)	(0.843)
INDB	0.148	0.148	0.148
	(0.128)	(0.128)	(0.127)
ACNEX	−0.0765	−0.0765	−0.0765
	(0.176)	(0.176)	(0.174)
ACIND	−0.141	−0.141	−0.141
	(0.116)	(0.116)	(0.115)
Constant	19.31	19.31	19.31
	(19.95)	(19.95)	(19.72)
Observations	430	430	430
R-squared	0.019		
Number of Year		3	

Standard errors in parentheses. ** $p < 0.05$.

The results also reveal that control variables like firm size, profitability, and board size significantly affect readability. Larger, more profitable firms with bigger boards tend to have higher readability scores. However, firms with larger boards tend to have lower readability scores. Variables such as liquidity, leverage, independent board, audit committee non-executives, and audit committee independence do not significantly impact readability. These results are consistent across all models, indicating the analysis's validity.

4.6. Additional Analyses

4.6.1. The Effect of Different Types of Risk Disclosure on the Readability

Table 8 presents the results of additional analyses examining the impact of different types of risk disclosure on the readability of annual reports from non-financial firms listed on the FTSE All Shares index. The analyses reveal a positive and significant relationship between COVID-19 disclosure and readability at a 5% significance level across all regression models. This indicates that firms providing detailed COVID-19 information tend to have higher readability scores, suggesting their annual reports are more comprehensible.

The analyses also show that different types of risks significantly impact readability. Credit risk disclosure (CRRD) and strategic risk disclosure (STGRD) positively correlate with readability, implying that firms disclosing more information about these risks produce more informative and clearer annual reports. Conversely, operational risk disclosure (OPRD) negatively correlates with readability, suggesting that firms disclosing more information about this risk produce more complex and obscure annual reports. Liquidity risk

disclosure (LIQRD), market risk disclosure (MRRD), and business risk disclosure (BUSRD) do not significantly impact readability.

Table 8. The effect of risk disclosure types on readability.

	OLS	Random	Tobit
Variables	**Flesch**	**Flesch**	**Flesch**
COVID	0.680 **	0.680 **	0.680 **
	(0.00988)	(0.00988)	(0.00970)
CRRD	0.0876 *	0.0876 *	0.0876 *
	(0.0463)	(0.0463)	(0.0455)
OPRD	−0.288 **	−0.288 **	−0.288 **
	(0.0223)	(0.0223)	(0.0219)
LIQRD	−0.119	−0.119	−0.119
	(0.285)	(0.285)	(0.280)
MRRD	0.00391	0.00391	0.00391
	(0.0203)	(0.0203)	(0.0199)
STGRD	0.0872 ***	0.0872 ***	0.0872 ***
	(0.0488)	(0.0488)	(0.0479)
BUSRD	−0.0451	−0.0451	−0.0451
	(0.0414)	(0.0414)	(0.0406)
FSIZE	0.676 **	0.676 **	0.676 **
	(1.389)	(1.389)	(1.364)
LIQ	−0.0535	−0.0535	−0.0535
	(1.445)	(1.445)	(1.418)
ROA	28.14 **	28.14 **	28.14 **
	(17.83)	(17.83)	(17.51)
LEV	−6.570	−6.570	−6.570
	(9.264)	(9.264)	(9.096)
BSIZE	−0.668 **	−0.668 **	−0.668 **
	(0.846)	(0.846)	(0.831)
INDB	0.110	0.110	0.110
	(0.125)	(0.125)	(0.123)
ACNEX	−0.123	−0.123	−0.123
	(0.166)	(0.166)	(0.163)
ACIND	−0.134	−0.134	−0.134
	(0.114)	(0.114)	(0.112)
Constant	44.63 **	44.63 **	44.63 **
	(20.67)	(20.67)	(20.30)
Observations	444	444	444
R-squared	0.042		
Number of Year		3	

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The additional analyses, conducted to test the robustness and validity of our results, utilized different regression models to control for potential outliers, heteroscedasticity, endogeneity, and censoring issues. The results, shown in Table 8, confirm the main findings. The varying effects of different risk types on readability align with the Proprietary Cost Theory, which posits that firms balance the benefits and costs of disclosure, especially when the information is proprietary or sensitive.

For instance, COVID-19 risk disclosure may positively impact readability as firms disclose more information about their COVID-19 response and impact to signal transparency and legitimacy to stakeholders and reduce the uncertainty and complexity of the pandemic. However, it may negatively impact readability if firms disclose more complex and uncertain information about COVID-19 risks and uncertainties, impairing user comprehension and interpretation.

Similarly, credit risk disclosure may positively impact readability as firms disclose more information about their credit risk exposure and management to reduce information

asymmetry and enhance credibility with creditors and investors. However, it may negatively impact readability if firms disclose more technical and detailed information about their credit risk measurement and reporting, increasing the complexity and difficulty of the text.

The results of the additional analyses align with the theories used for the main analyses, such as the information asymmetry theory, the institutional theory, and also the proprietary cost theory. These theories provide explanations and interpretations for the relationship between risk disclosure and readability and the impact of COVID-19 disclosure and different types of risks on this relationship. The additional analyses confirmed and supported our main results, finding similar coefficients and significance levels for the main variables of interest, such as RDL, COVID, and the different types of risks. The results also showed that our main results were robust and valid across different models and measurements, indicating the quality and accuracy of our data and methods.

4.6.2. Impact of ROA on Risk Disclosure and Readability

To further investigate the relationship between risk disclosure and readability, we employed a subsampling technique based on Return on Assets (ROA). Table 9 presents the results, with Model 1 reflecting profitable firms (positive ROA) and Model 2 representing loss-making firms (ROA of zero or less). This approach provides deeper insights into the role of risk disclosure, particularly during the COVID-19 pandemic. The OLS regression analysis reveals a positive and significant relationship between risk disclosure levels (RDL) and readability for profitable firms, as indicated by a coefficient of 0.856. This suggests that these firms benefit from clear communication of their risks. Conversely, for firms with negative ROA, the relationship is not significant, with a coefficient of -0.503, indicating that risk disclosures may not enhance readability for underperforming firms. By separating the sample based on ROA, we highlight the differing impacts of risk disclosure on firms with varying financial health. This distinction informs stakeholders of the need for tailored risk communication strategies based on a firm's performance level. Moreover, it strengthens the robustness of our findings by ensuring that overall results are not skewed by underperforming firms that may disclose risks less effectively. This analysis reinforces our primary conclusion that higher levels of risk disclosure positively correlate with readability, particularly for profitable firms. It emphasizes the critical importance of effective risk communication in building stakeholder trust and supporting informed decision-making, especially in the context of the challenges posed by the COVID-19 pandemic.

Table 9. Comparative Impact of risk disclosure on readability among profitable and non-profitable firms.

	Profitable	Non-Profitable
Variables	**Readability**	**Readability**
RDL	0.856 **	−0.503
	(0.443)	(0.474)
FSIZE	0.382 **	0.148 *
	(1.424)	(1.406)
LIQ	−0.191	−1.410
	(1.481)	(0.931)
ROA	17.61 **	1.068
	(22.29)	(22.64)
LEV	−9.193	11.70
	(9.999)	(10.88)
BSIZE	−1.043 **	−1.813 *
	(0.943)	(0.976)
INDB	0.188	−0.103
	(0.143)	(0.126)
ACNEX	−0.098	−0.166
	(0.191)	(0.177)
ACIND	−0.156	0.0666
	(0.131)	(0.112)
Constant	30.92	22.48
	(21.95)	(24.87)
Observations	395	58
R-squared	0.027	0.138

Standard errors in parentheses. ** $p < 0.05$, * $p < 0.1$.

5. Conclusions

We examined how risk disclosure and readability in UK non-financial firms' annual reports relate during COVID-19. We aimed to answer: How does risk disclosure affect readability? How does COVID-19 disclosure moderate this relationship? How do different risk types influence readability? We used regression models and data from FTSE all share non-financial firms from 2019 to 2021 to test our hypotheses. We found a positive and significant relationship between risk disclosure and readability: firms disclosing more risks have more readable reports. COVID-19 disclosure strengthens this relationship: firms disclosing more COVID-19 and risk information have more readable reports than others. Different risk types have differential effects on readability: COVID-19, credit, operational, and strategic risks positively affect readability, while liquidity, market, and business risks have no effect.

This study's findings have implications for both the theory and practice of risk disclosure and financial communication. This study's findings have implications for both the theory and practice of risk disclosure and financial communication. Theoretically, this study advances the literature on information asymmetry and institutional theory by elucidating the interplay between risk disclosure, readability, and the COVID-19 pandemic. It demonstrates how both external factors, such as the COVID-19 outbreak, and internal factors, including firm characteristics and types of risks, influence risk disclosure and readability. By introducing a new risk definition and category specific to the COVID-19 pandemic, the study enhances existing theoretical frameworks and provides a basis for future research. Furthermore, it develops novel measurements for risk disclosure, encompassing credit, liquidity, market, operational, business, strategic, and COVID-19 risks, thereby advancing methodological approaches in the field. The introduction of a specific COVID-19 risk category contributes to future research by offering a framework that can be utilized in subsequent studies. Methodologically, the research employs a content analysis approach and CFIE software to measure the level of risk disclosure and readability in the annual reports of non-financial firms listed on the FTSE All-Share from 2019 to 2021. This methodology allows for a systematic examination of how different types of risk disclosures impact readability, revealing that COVID-19 risk, credit risk, and strategic risk positively affect readability, while operational risk negatively affects it. The findings provide practical insights for managers, investors, regulators, and standard setters on improving risk disclosure and readability during crises. By emphasizing the importance of clear and comprehensive risk disclosures, the study highlights how firms can enhance stakeholder trust and facilitate informed decision-making.

Practically, the study's findings provide valuable insights for managers, investors, regulators, and standard setters on enhancing the quality and effectiveness of risk disclosure and readability, especially during crises. Clear disclosure of COVID-19-related risks improves readability, reduces information asymmetry, and strengthens stakeholder trust. The study advocates prioritizing relevant and material risk disclosures—such as those related to COVID-19, credit, operational, and strategic risks—while avoiding unnecessary or irrelevant risks like liquidity and market risks, which can detract from overall clarity. Robust risk management frameworks and transparent risk disclosure practices are vital for protecting public health and financial stability during crises.

The findings highlight the critical role of effective risk communication in enhancing a firm's reputation and financial performance. For managers and corporations, prioritizing clear and concise risk disclosures can improve investor confidence, reduce capital costs, and mitigate litigation risks. Aligning risk disclosure practices with broader corporate governance objectives ensures consistency and reliability in financial reporting, fostering long-term stakeholder trust. For investors, readable and informative risk disclosures are crucial for making informed investment decisions. By providing clearer insights into a firm's risk profile, investors can more accurately assess potential returns and risks, leading to improved portfolio diversification and risk management. This clarity is especially important during periods of economic uncertainty, such as the ongoing adjustments in

the post-Brexit UK economy. For regulators and Standard-Setters, the study provides compelling evidence supporting the need for more stringent regulations governing risk disclosure and readability. Policymakers should develop guidelines and standards that promote transparent and understandable financial reporting, including the use of plain language, standardized formats, and visual aids to enhance the accessibility of financial reports for all stakeholders, including non-professional investors. These regulations should also ensure that firms can effectively communicate risks while adhering to practical and beneficial standards for all involved parties. Drawing on best practices from other jurisdictions that have successfully implemented similar guidelines could serve as a useful reference for policymakers.

For academic Researchers, this study contributes to the existing body of knowledge on risk disclosure, readability, and corporate communication, offering a foundation for future research on the evolving landscape of risk management and reporting. Researchers are encouraged to explore emerging challenges such as climate change and technological disruption, where clear communication of risks will continue to be paramount. Future research could investigate how different industries adapt their risk communication strategies in response to regulatory changes, providing further insights into effective risk management practices. The study's results emphasize the need for specific and actionable policy recommendations. Policymakers should focus on developing risk disclosure standards that prioritize transparency and understandability, particularly during crises. These standards should mandate the use of plain language, standardized formats, and visual aids to enhance the accessibility of financial reports for all stakeholders, including non-professional investors. Also, enforcing stricter guidelines for risk reporting—emphasizing clarity and comprehensiveness—will improve transparency in financial markets and support better decision-making during times of crisis.

This study Focusing on UK non-financial firms in the FTSE All Share index may limit generalizability and introduce bias. The study assumes risk disclosure and readability are independent and affected by the same factors, potentially neglecting their interrelation and variation across different pandemic stages. Automated and subjective tools used for risk disclosure and readability may entail errors, biases, or suboptimal levels. The use of purposive sampling and voluntary disclosure may cause non-representativeness or selection effects. Other forms or quality aspects of disclosure that may influence readability and financial communication are not considered. While the 2019–2021 period is deemed essential for understanding immediate responses to the crisis, future research could extend the analysis to include 2022 and beyond, exploring the long-term implications of COVID-19 on risk disclosure practices. Expanding the observation period would provide a more comprehensive understanding of how firms' risk disclosure practices evolve over time, particularly as the pandemic's impact shifts from an acute crisis to a more chronic situation.

This study suggests further research on risk communication and readability during COVID-19. Future studies should use a larger, diverse sample, analyze data longitudinally, explore different types of disclosures and their attributes, and apply advanced text analysis tools. Rigorous indicators should be used to measure risk communication and readability. Random or stratified sampling in a mandatory disclosure setting should be used to minimize selection bias. Extending the observation period to include pre-pandemic (before 2019), during pandemic (2019–2020), and post-pandemic (2021–2023) phases would offer valuable insights into the dynamic nature of risk disclosure practices and their relationship with readability across different stages of the crisis. This study contributes to the literature on risk disclosure, readability, and external factors during COVID-19, and provides practical insights for stakeholders. It calls for continued research to deepen the understanding of risk disclosure and its impact.

The call to action requires firms to enhance risk disclosure, particularly by addressing emerging threats such as pandemics and other potential crises and by communicating this information plainly. While the COVID-19 pandemic has emphasized the importance of disclosing pandemic-related risks, firms should also prioritize the disclosure of other

material risks that could impact their operations and financial performance. A robust risk management framework should encompass the identification, assessment, and communication of a broad range of risks, including but not limited to health crises, natural disasters, regulatory changes, and technological disruptions. Simultaneously, regulators must impose stricter standards for risk reporting and readability, especially in times of uncertainty. These standards should apply to a wide range of risks and not be limited to specific events like the COVID-19 pandemic. By developing comprehensive guidelines for risk disclosure, regulators can ensure that firms are prepared to manage and communicate various types of risks effectively. Proposing a transformative approach, this recommendation suggests mandating firms to disclose material risks in clear language and employ visual elements. This multifaceted initiative, encompassing both corporate and regulatory spheres, aims to elevate the quality and transparency of risk communication, ensuring clarity for investors and other stakeholders, regardless of the nature of the risk. By emphasizing the importance of managing various types of risks, including but not limited to pandemics, this approach emphasizes the need for a proactive and adaptable risk management strategy. Firms should continuously assess their risk profiles, identify emerging threats, and develop strategies to mitigate and communicate these risks effectively. This will not only enhance stakeholder trust but also contribute to the overall resilience and sustainability of the business ecosystem. In light of the COVID-19 pandemic no longer being classified as a public health emergency, it is crucial for firms to apply the lessons learned to future crises. The pandemic has highlighted the importance of robust and adaptable risk management strategies that can address a wide array of potential threats. Firms should not only focus on past crises but also proactively prepare for future events that may pose significant risks to their operations and financial performance.

Author Contributions: Conceptualization, A.S.M. and M.E.; Methodology, A.S.M. and M.E.; Formal analysis, M.E.; Writing—original draft, A.S.M.; Writing—review & editing, A.S.M. and M.E.; Project administration, A.S.M. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement: The article makes use of existing (secondary) data.

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