ISSN 2090-3359 (Print)
ISSN 2090-3367 (Online)

Advances in Decision Sciences

Volume 30
Issue 2
June 2026

亞洲大學
ASIA UNIVERSITY
SCIENTIFIC & BUSINESS WORLD

Published by Asia University, Taiwan and Scientific and Business World

The Impact of Firm–Specific Characteristics on the Readability of Bank Annual Reports: Evidence from MENA Countries

Rasha Mohamad Mahboub

Faculty of Business Administration, Department of Accounting,

Beirut Arab University, Lebanon.

Corresponding author Email: r.mahboub@bau.edu.lb

ORCID: https://orcid.org/0000–0001–5071–0025

Received: February 3, 2025; First Revision: October 13, 2025;

Last Revision: March 23, 2026; Accepted: March 29, 2026;

Published: March 31, 2026

Abstract

Purpose: This study examines how firm–specific characteristics—profitability, size, liquidity, age, and leverage—affect the readability of the narrative sections of annual reports of major MENA banks. While prior research focuses on developed countries, evidence from the MENA region remains limited. This study addresses this gap by integrating textual readability measures with firm–level financial data across several MENA countries, offering a novel regional perspective.

Design/methodology/approach: Panel data from 29 banks across five MENA countries (Lebanon, Qatar, Saudi Arabia, UAE, and Oman) for 2020–2023 were analyzed using multiple regression models.

Findings: Profitability and liquidity positively influence annual report readability, whereas bank age has a negative effect. Size and leverage do not significantly affect readability. These findings suggest that financially stronger and more liquid banks produce narratives that are easier to process, thereby reducing readers' cognitive load and facilitating faster and more accurate decision-making by investors, regulators, and analysts.

Research limitations/implications: The study is limited to five countries and five characteristics. Future studies might build on these results by looking at other regions, industries, or corporate characteristics.

Practical implications: improved readability enhances information processing efficiency, supporting better investment evaluation, regulatory oversight, and risk assessment in banking decisions.

Originality/value: This research contributes to Decision Sciences by demonstrating how firm-level financial characteristics influence the cognitive accessibility of financial narratives, thereby shaping the quality and efficiency of stakeholder decision-making in emerging markets.

Keywords: Annual Report; Chairman Letter; MENA Region; Narrative; Readability.

JEL Classification: M41.

1 Introduction

The organization's annual report (AR) is one of the most important media for communication between any publicly traded entity and its shareholders (Sahyda et al., 2019). Courtis (1995) considered the organization's AR as an accountability report for the BOD in supervising the public firms. It is used to inform creditors, shareholders, and other users about the firm's history, its current financial position, and its anticipated course of action. Thus, it becomes a decision–making means for stakeholders as they depend on it to take the correct decision whether to buy, keep, or sell stocks (Sahyda et al., 2019), and it is viewed as the most important source of information disclosure and a key communication tool for various users (Mahboub et al., 2017). As the business environment changes and becomes more complex, investors demand better information. This leads to raising the responsiveness of AR. Consequently, the usefulness of AR has increased considerably in recent years (Athanasakou et al., 2024; Nguyen & Kimura, 2018).

The AR of any entity contains two sections, quantitative and qualitative (Mahboub et al., 2016). The qualitative section is the most important part. Previous studies (Jones, 1988; Mahboub et al., 2017) have confirmed that the highest number of investors rated the chairman's statement as the most read part in the AR. Qualified investors have enough knowledge to understand the AR. Whereas the unsophisticated investor who has simple knowledge in accounting could find it hard to read the financial statements (Mohamad & Abdul Rahman, 2006). Therefore, they choose to get information from other parts of the AR –the chairman's statement– which is written in a less technical language (Mohamad & Abdul Rahman, 2006). Thus, the chairman's statement receives more attention than other statements that are not overseen by IFRS (Yasseen et al., 2017). This is mainly due to the impact it has on users' decision–making (Merkl–Davies & Brennan, 2007). It is considered one of the key documents of the AR to communicate qualitative information (Wang, 2016). It is commonly acknowledged as one of the most influential sources of information that engages the interest of both financial analysts and institutional investors (Leite, 2021; Mahboub, 2024).

Hence, effective communication appears when the users receive the correct message conveyed by the sender. Thus, readability (RD) has become a significant element to achieve an effective financial reporting communication (Mohamad & Abdul Rahman, 2006). Several professional bodies around the world, such as the SEC, have issued specific guidelines for enhancing the disclosures to be more readable (Rutherford, 2003). Hence, RD is the ease with which a reader can understand a written text (Quaresma & Graziani, 2023). Thus, any AR issued by the firm must be readable so that the information presented in the report benefits shareholders and stakeholders. Hence, RD is a vital factor in the firm's success in sending accounting messages to its stakeholders that need to be considered (Ebaid, 2023). The textual complexity damages the effective communication between publicly traded companies and their stakeholders because one principle of effective communication is that readers interpret messages they receive as those which the sender wishes to convey (Courtis, 1995). A trusting relationship between companies and their stakeholders can only be ensured through a good communication policy (Ajina et al., 2016). Given this fact, "efforts were made by the International Accounting Standard Board in October 2017 to release

reports on structural changes and the simplification of language in financial reporting so that RD and clarity can increase without losing information" (Shauki & Oktavini, 2022, p. 1).

Although the significance of the RD of the ARs, findings show that companies' ARs are extremely difficult to read, they belong to a text type that is probably to be inaccessible (Ajina et al., 2016). For instance, Shauki and Oktavini (2022) found the ARs of companies listed on the Indonesia Stock Exchange were difficult to read. This result was confirmed by Nguyen and Kimura (2018), who found that the ARs of foreign firms in the United States Stock Exchange were difficult to read. Similarly, Jones and Shoemaker (1994) revealed that company ARs are extremely hard to read. Hence, a barrier happens when narrative disclosures in ARs are written at a level of understanding away from the abilities of most audiences (Courtis, 1995). This means that writing that is hard to read masks some unfavorable aspect of corporate behavior. Accordingly, the difficulty of ARs strengthens the "information asymmetry" between managers and investors and leads to "agency conflicts" (Ajina et al., 2016).

More specifically, despite the recognized importance of RD in ARs, a significant problem persists: the narrative sections, particularly the chairman's statement, are often written in a complex manner that hinders comprehension. This complexity not only alienates less sophisticated investors but also exacerbates information asymmetry and agency conflicts within the MENA banking sector (Mahboub et al., 2017). Existing literature has primarily focused on developed countries, leaving a substantial gap in understanding how these issues manifest in the MENA region. Thus, there is a pressing need to explore the specific factors affecting RD in the context of MENA banks, as prior studies have not adequately addressed the unique challenges faced by stakeholders in this region (Huong Dau et al., 2024). Consequently, the lack of understanding can adversely affect investment decisions, stakeholder trust, and overall market efficiency. Addressing this issue is crucial for enhancing transparency and fostering informed decision–making among stakeholders in the MENA region.

Given that the narrative part of ARs attracts the attention of various stakeholders, several studies have examined the RD of ARs (Sahyda et al., 2019). However, most of those studies are conducted in developed countries such as the USA (Bendriouch et al., 2023) and the UK (Mohammed, 2022) while neglecting the unique contexts of emerging markets, particularly in the MENA region. Previous studies indicated that the developments in the studies of the RD of the ARs in the MENA region, particularly in banking, remain underexplored and poorly understood, and have not been very rapid and still quite fresh (Mahboub et al., 2017). Thus, there is a significant research gap in the literature.

Hence, there is a lack of empirical research examining how firm–specific characteristics—such as profitability (PROF), size (SIZ), Leverage (LEV), age (AGE), and liquidity (LIQ)—affect the RD of ARs in this region. Moreover, existing literature has primarily concentrated on quantitative aspects of financial reporting, overlooking the qualitative dimensions that are critical for effective communication with stakeholders. Specifically, the narrative sections, particularly the chairman's statements, are often written in complex language that can alienate less sophisticated investors, exacerbating information asymmetry and agency conflicts. This gap in understanding how RD affects stakeholder decision–making in the

MENA banking sector highlights the need for focused research. Thus, there is a pressing need to investigate the specific factors influencing RD in major banks within Lebanon, Qatar, Saudi Arabia, the United Arab Emirates, and Oman, as prior studies have not adequately addressed these unique challenges.

This study is original in many important ways. First, it broadens the scope of prior RD research – mostly concentrating on western and developed countries— by investigating the factors influencing RD within the five MENA nations' banking sectors: Lebanon, Qatar, Saudi Arabia, United Arab Emirates, and Oman. Second, it especially examines how company–specific traits – PROF, SIZ, LEV, AGE, and LIQ – influence the RD of the narrative part, particularly the chairman's statement, which MENA financial communication research still misses. Third, it unites firm–level financial indicators with qualitative disclosures' textual analysis, therefore presenting a multi–dimensional strategy never used previously in research. Together, these new elements collectively set this study among the first cross–country empirical studies of RD in the MENA banking sector apart. Unlike prior RD studies that mainly document RD levels or focus on single firm characteristics in isolation, this study offers an integrated, determinant–based model that explains why RD varies across banks by jointly linking financial structure, organizational maturity, and liquidity conditions to narrative disclosure complexity.

Based on that, this research aims to fill this research gap in the narrative part – chairman statement – of ARs of major banks in selected MENA countries (Lebanon, Qatar, Saudi Arabia, United Arab Emirates and Oman). More specifically, it aims to examine how factors like (PROF, SIZ, LEV, AGE, and LIQ) would affect RD level of the narrative section of the MENA region banking sector's ARs; especially noting that "the banking sector in several countries in the Middle East need to be capable of generating and utilizing more information about future events in order to upgrade business strategy and achieve advanced levels of company performance" (Alabdullah, 2019, p. 101). Thereby contributing valuable insights to the existing literature and informing practical approaches to financial reporting. The selected region is an interesting case study because "the MENA region is considered to be a bank–based economy, since banks dominate the stock market as a result of the shallow, underdeveloped capital markets which do not provide the ideal conditions for firms to access capital with ease" (Houshaimi, 2020, p. 138).

Theoretically, the significance of this research is to spread awareness about the factors that would affect the RD level of the bank's ARs in MENA countries. This research would boost the literature and provide opportunities for additional research to expand the issues. Practically, this research is beneficial for all users of ARs in the MENA countries as it helps them understand more about the legal tricks that the chairman would use to mislead their decisions. It also notifies them about the factors that affect the RD of the ARs. Thus, users, mostly the investors, should be very careful while reading an AR. In addition, this research would be significant for auditors since they are only required to audit the quantitative section of the AR, whereas the most important part of the AR, which is the narrative part, is not regulated and not audited. Furthermore, the research will benefit the policy makers and encourage them to recommend a policy to include the narrative part of the AR for specific regulations that prevent the chairman from using such complex language in writing it. From a Decision Sciences perspective, this study contributes by demonstrating how the RD of narrative financial disclosures influences stakeholders' cognitive processing,

information interpretation, and ultimately the quality of financial decision–making under conditions of information asymmetry.

Overall, this study adds a significant contribution by offering both regional and methodological novelty. It broadens knowledge of how company–specific features affect RD in AR of MENA banks—a factor mostly ignored in earlier research. These original contributions broaden the literature on corporate disclosure; clarify practical insight into communication transparency, and offer policymakers evidence to support clearer disclosure standards in developing economies.

The rest of the study continues as follows. Section Two reviews the previous research. Section Three presents the theoretical framework and develops the hypotheses. Section Four designates the research design and data collection. Section Five reports the findings. Section Six provides a discussion of the results. Section Seven details the theoretical and practical implications for the study, and Section Eight concludes and sets out the recommendations.

2 Literature Review

Many studies have investigated RD, since the narrative section of an AR has attracted great attention from various stakeholders (Sahyda et al., 2019). However, previous research on the RD of ARs has been carried out in developed countries. Meanwhile, very little progress has been made in the study of RD of ARs in developing countries, including the MENA region, to provide a perspective from this region (Mahboub et al., 2017). In this sense, this research intends to fill the gap of RD studies, since understandability is one of the "qualitative characteristics of accounting information" according to the IASB Conceptual Framework. Hence, studying organizational factors that may be related to the degree of annual report readability (ARR) is important to understand the aspects that have a greater influence on accounting communication to the market, which is one of the accounting goals (Checon et al., 2018).

Several studies have been done about the RD of the accounting narratives, and examined the factors that would affect the level of RD in any AR. The factors that are considered in the literature review are PROF, SIZ, LEV, AGE, and LIQ. These factors were chosen because they received more attention than other factors.

2.1 Profitability

One of the determinants of the RD of the AR is the PROF. PROF means the capacity of the company to generate revenue in excess of expenses by using its resources (Gray, 2013). Several studies have tested the relationship between PROF and RD; however, the results were inconclusive. Previous studies revealed that the performance of the company affects managers to issue a readable or difficult AR (Aymen et al., 2018; Lo et al., 2017). For instance, Abdul Rahman et al. (2012), Abu Bakar and Ameer (2011), Alduais (2024), Biddle et al. (2009), Dalwai et al. (2023), Dempsey et al. (2012), Gu and Dodoo (2020), Gutiérrez Ponce et al. (2024), Li (2008), Prasad et al. (2013), A. A. Rahman (2014), Richards (2011), Subramanian et al. (1993), and Sun et al. (2023) used a variety of techniques in their research and found that PROF is

positively associated with ARR. This means that a firm with good performance will produce ARs that are easier to read compared to companies with negative performance that will issue ARs that are harder to read, a practice known as impression management (Gray, 2013; Neu et al., 1998). In contrast, Baker and Kare (1992), Bayerlein (2010), Jones (1988), Kumar (2014), Raimo et al. (2022), Rutherford (2003) and Srinivasan et al. (2017) revealed that there was no apparent association between the PROF of a firm and its ARR. These findings do not suggest that RD levels have been manipulated in order to obfuscate performance. In addition, Smith and Taffler (1992) and Smith et al. (2006) emphasize that RD measures primarily capture textual complexity and do not necessarily reflect intention obfuscation related to firm performance.

2.2 Size

The second determinant of the RD of the AR is bank SIZ. The SIZ of any bank captures many sides of the business environment of the bank (Li, 2008). Previous studies specified that the SIZ of the bank influences the quality of the reported information (Gu & Dodoo, 2020). However, evidence from studies concerning the association between bank SIZ and RD is inconclusive. For instance, Ajina et al. (2016), Gutiérrez Ponce et al. (2024), Jones (1988), Kumar (2014), Li (2008), Lo et al. (2017), Luo et al. (2018), and Roiston and Harymawan (2020) found a significant negative association between firm SIZ and RD, demonstrating that bigger companies provide more difficult-to-read ARs than smaller companies. The anticipation is that bigger firms will have less readable ARs because bigger firms are likely to be more complicated geographically and operationally (Dempsey et al., 2012). Whereas, Baker and Kare (1992), Dempsey et al. (2012), Prasad et al. (2013), Raimo et al. (2022), Shauki and Oktavini (2022), and Srinivasan et al. (2017) reported the opposite, the larger the SIZ of firms, the simpler the texts are to read. This demonstrates that bigger companies have additional resources available to secure enhanced corporate communications that could subsequently lead to enhanced RD (Abu Bakar & Ameer, 2011). Moreover, as the SIZ of the company increases, the company is under increased analyst and public center of attention. Thus, the companies have a major motive to make their texts easy in order to deal with the communication needs of a broader diversity of stakeholders (Srinivasan et al., 2017). However, Abu Bakar and Ameer (2011), Clatworthy and Jones (2003), Ginesti et al. (2017), Gu and Dodoo (2020), Habib and Hasan (2020), Richards (2011), and Rutherford (2003) found no significant association between firm SIZ and RD.

2.3 Leverage

The third determinant of the RD of the AR is the financial LEV. Bobinaite (2015, p. 30) stated, “The financial LEV is associated with the financing activities. If the fixed cost funds, which require a fixed interest rate or fixed preferred dividend payments, are included in the capital structure of the company, it is said that the company uses the financial LEV. Since the use of debt is more common in practice than the use of preferred capital, the financial LEV usually refers to the use of debt in capital structure. A company having debt on its balance sheet is called leveraged, and a company that finances its activity only through equity is said to be unleveraged”. Many researchers investigated the association between LEV and RD, and the findings were diverse. For instance, Ebaid (2023), Moreno and Casasola (2016),

Ndegwa (2022), and Telles (2018) confirmed that LEV had no significant impact on the RD of AR. In contrast, Ajina et al. (2016), Dempsey et al. (2012), Ezat (2019), Melón–Izco et al. (2021) and Rutherford (2003) found that LEV had a significant and negative impact on the RD of AR. Companies with more leveraged capital structure may have to provide more multifaceted disclosures when clarifying all the information interrelated to their debt structure. The most indebted companies tend to issue ARs that are less readable. Highly leveraged companies may need to clarify their positions to the market. These clarifications can add complications to the information. Conversely, Ahmad and Maochun (2019), Cazier and Pfeiffer (2017), Gutiérrez Ponce et al. (2024), Nandi and Ghosh (2013), Raimo et al. (2022), Rasheed (2024), and Shauki and Oktavini (2022) revealed that LEV had a significant and positive impact on the RD of AR.

2.4 Age

The fourth determinant of the RD of the AR is the bank AGE. AGE is the length of time during which a thing has existed. Researchers define bank AGE as the "number of years" of incorporation of the bank (Lim et al., 2018). AGE can affect the RD of the ARs, so that stakeholders can analyze bad news hidden by the manager or fraudulent financial reporting made by managers (Roiston & Harymawan, 2020). However, the association between firm AGE and the RD of ARs has been imprecise. Efretuei (2013), Siano and Wysocki (2018), Tuo et al. (2019), and Xu et al. (2018) found a significant and negative impact of firm AGE on the RD of AR. This means that older companies will have a low RD level, which will make their ARs more difficult to understand. This may occur because a company with an older firm AGE is the consequence of management manipulation as they gain more experience, and as a result, the company has the necessary skills to control the contents of the AR to make the company's performance appear good. On the contrary, Melón–Izco et al. (2021), Mohammadi and Naghshbandi (2019), and Ndegwa (2022) confirmed that firm AGE had no significant impact on the RD of AR. Contrary to this, Ben–Amar and Belgacem (2018), Ejaz et al. (2022), Etuk and Akpan (2023), D. Rahman et al. (2024) and Roiston and Harymawan (2020) found a significant and positive effect of firm AGE on the RD of AR. This indicates that older companies may have an RD difference with regard to AR because of the reduced information asymmetry for these companies. If investors know better and have more accurate information about the business models of older companies, the AR of older companies will be simpler and easier to read (Li, 2008).

2.5 Liquidity

The fifth determinant of the RD of AR is the LIQ. Wallace and Naser (1995, p. 320) defined LIQ as "the ability of a company to meet its short–term financial obligation without having to liquidate its long–term assets or cease operations". There is spontaneous demand and theoretical support for the belief that longer ARs with less boilerplate will be correlated with better transparency, leading to higher LIQ. Although this fact, however, there is little existing literature investigating the association between LIQ and RD of ARs (Lang & Stice–Lawrence, 2015). Glosten and Milgrom (1985) suggests that LIQ is greater for companies with greater levels of disclosure. Moreover, Lang and Stice–Lawrence (2015) found that LIQ tend to be

higher for companies whose ARs are longer and encompass less fog and boilerplate. In addition, Habib and Hasan (2020) demonstrated that companies with less readable disclosures embrace significantly more cash. Besides, Dalwai et al. (2023) found that the finance sub–sector has more readable reports and more LIQ.

3 Theoretical Framework and Hypothesis Development

Information disclosure generally consists of three sections, comprising the content, timing, and presentation of information. The effectiveness of each of the three sections relies on the RD of the ARs (Mohammadi & Naghshbandi, 2019). RD refers to the estimated manner a reader is expected to read and comprehend the text. Recently, RD has been of particular interest to the legislators in the capital markets. For instance, the SEC requested that companies publish more readable and comprehensible ARs, demonstrating that firms should refrain from publishing multifaceted, extended, or excessive ARs because not all investors are able to read complex company reports quickly (Lehavy et al., 2011).

Based on previous studies, substantial rules for writing documentation have been established by experts (DuBay, 2004). These include: “Use short, simple, and familiar words; Avoid jargon; Use language that is culturally and gender neutral; Use correct grammar, punctuation, and spelling; Use simple sentences, active sounds, and present sentences; Start instructions in imperative mode by starting sentences with active verbs; Use simple graphic elements such as bulleted lists and numbered steps to create information visually accessible” (Sahyda et al., 2019, p. 164).

A number of explanations have been offered by the accounting literature to explain why managers create ARs more or less readable. For instance, Agency Theory postulates that when agency issues escalate, managers will disclose non–financial information more frequently and more effectively, making it easier to read and comprehend. According to Signaling Theory, underperforming businesses typically conceal inaccurate information and make their reports more challenging to read and understand. Conversely, high–profit, well–performing businesses are said to be sending out signals through RD. Regarding the Legitimacy Theory, it suggests that the RD of ARs legitimizes the activities of the company and makes it possible to achieve the community's belief in the company as socially responsible. Reports at a higher–level RD is associated with many positive economic consequences (Neu et al., 1998).

Drawing from the theoretical frameworks discussed in the above section—specifically, Agency Theory, Signaling Theory, and Legitimacy Theory—this research presents a series of hypotheses intended for empirical testing. These hypotheses are based on robust theoretical expectations regarding how factors such as PROF, SIZ, LEV, AGE, and LIQ influence the RD levels within the narrative sections of the ARs in the banking sector. The development of these hypotheses facilitates a systematic exploration of the associations between firm attributes and RD in the setting of the MENA region. Consequently, the subsequent hypotheses are put forward:

H_1: Profitability has a significant effect on the readability of annual reports.

H_2: Bank size has a significant effect on the readability of annual reports.

H_3: Leverage has a significant effect on the readability of annual reports.

H_4: Bank age has a significant effect on the readability of annual reports.

H_5: Liquidity has a significant effect on the readability of annual reports.

These hypotheses illustrate the objective of the study, which is to comprehend the influence of firm characteristics on RD level within the MENA region.

4 Research Methodology

4.1 Data Collection and Sample Size

Data can be collected from different sources based on the nature of each research. The data for this research were collected from the published ARs on the bank's official websites in the English language of a sample of 29 major banks in the MENA region countries: Lebanon, Qatar, Saudi Arabia, United Arab Emirates, and Oman, for a period of four years, 2020–2023 (Table 1). The sample banks are selected based on stratified sampling, ensuring several bank attributes are represented. This stratified sampling technique is rather important as it enables a more sophisticated grasp of how AR of different types of banks may have different RD ratings.

Table 1: Sample Size

Country	Number of Annual Reports
Lebanon	32
Qatar	20
Saudi Arabia	20
United Arab Emirates	28
Oman	16
Total	116

Source: Author's Own Research

The criteria of selection of these banks are that the bank has published its AR on its website in the English Language for four consecutive years; otherwise, the bank will be excluded. This approach aligns with the established practices in financial research. These MENA countries were chosen because the banking sector of these countries is well developed, efficient, and profitable (Tlemsani & Al Suwaidi, 2016). This selection is justified as it lays a solid basis for analyzing RD patterns within a robust banking environment. Further, these countries were also chosen for the practical reason that the researcher was able to obtain the ARs of banks residing therein from corporate websites. The choice of the period 2020–2023 is particularly important, as it represents the first effort to study RD in AR within the MENA region following the economic changes surrounding 2019.

4.2 Measurement of Variables

4.2.1 Measurement of Dependent Variable

This research used Flesch readability scores (FRS) to measure the dependent variable ARR. The Flesch Reading Ease formula was chosen for its effectiveness in providing a clear and quantifiable measure of text RD, making it particularly suitable for assessing the complexity of written materials (DuBay, 2004; Flesch, 1960). One of the primary advantages of the FRS is its straightforward scoring system, which ranges from 0 to 100, where higher scores indicate easier RD. This simplicity allows writers and editors to quickly gauge how accessible their texts are to a general audience, which is crucial for effective communication, especially in contexts like ARs where diverse stakeholders are involved (Courtis, 1995).

In contrast, alternative measures such as the Flesch–Kincaid Grade Level, Gunning Fog Index, SMOG Index, Coleman–Liau Index, and Automated Readability Index offer different perspectives on RD but may not be as intuitive. For instance, the Flesch–Kincaid Grade Level translates RD into U.S. school grade levels, which can be useful for educational purposes but may not directly reflect comprehension ease for all readers (Readability Formulas, 2025). The Gunning Fog Index and SMOG Index focus on the complexity of words and sentence length, providing insights into the educational level required to understand a text, yet they can be less user–friendly for quick assessments. Similarly, the Coleman–Liau Index and Automated Readability Index emphasize character counts, which may not align as closely with reader comprehension as the Flesch Reading Ease formula does (Courtis, 1995).

The Flesch readability score is represented by the formula:

$$\text{Readability Score} = 206.835 - 1.015\text{SL} - 0.846\text{WL},$$

where SL is the Average sentence length (Number of words/number of sentences), and WL is the Average Word Length (Number of syllables/100 words)" (Flesch, 1960).

This formula generates an RD score on a scale ranging from 0 to 100. The higher the point scale, the easier to read the text, whereas the lower the point scale, the greater the reading difficulty (Abu Bakar & Ameer, 2011). For the purpose of this research, the researcher copied the chairman's letter of each bank and then pasted it into Microsoft Word 2010 to get the RD index. In calculating the FRS, the Review Tool in Microsoft Word 2010 was utilized since the FRS is available in a computerized format (Mahboub et al., 2017). The computation of the RD score is regarded as more accurate and reliable when accomplished via the computer program than by human computation (Harrison, 1980). Once the score has been determined, it is compared with a predetermined table, which provides an explanation of its RD (Table 2).

Table 2: Flesch Pattern of Reading Ease Ratings

Coding	Reading Ease Rating	Difficulty	Educational Level	Typical Magazine Style
1	0–30	Very Difficult	Postgraduate	Scientific
2	30–50	Difficult	Undergraduate	Academic
3	50–60	Fairly Difficult	Grade 10 – 12	Quality
4	60–70	Standard	Grade 8 –9	Digest
5	70–80	Fairly Easy	Grade 7	Slick Fiction
6	80–90	Easy	Grade 6	Pulp Fiction
7	90–100	Very Easy	Grade 5	comic

Source: Courtis, 1995, p. 7

4.2.2 Measurement of Independent Variables

The RD of bank ARs is investigated in this study in light of several firm–specific characteristics. Five independent variables are used in accordance with earlier research: profitability, size, leverage, age, and liquidity.

Profitability (PROF) is measured using Return on Assets (ROA), calculated as net income divided by total assets. ROA is sometimes used as a measure of managerial effectiveness and a company's capacity to produce profits from its asset base in financial and banking studies (Gu & Dodoo, 2020; Subramanian et al., 1993). More profitable banks are anticipated to be able to invest more in better readable disclosures.

Size (SIZ) is measured as the natural logarithm of total assets. This logarithmic transformation is often used in reducing skewness in financial data and guaranteeing comparability across companies of varying sizes (Luo et al., 2018). Larger banks may be subject to more public examination and regulatory pressure, therefore affecting the RD of their ARs.

Leverage (LEV) is defined as the debt ratio, calculated as total liabilities divided by total assets. This indicator reflects the degree to which a bank uses debt funding and records financial risk exposure (Luo et al., 2018). Highly leveraged banks may employ more complicated disclosures due to risk–related reporting needs.

Age (AGE) is measured as the natural logarithm of the number of years since the bank started operations. This proxy serves as a measurement of experience and organizational maturity that could affect reporting techniques and disclosure style (Roiston & Harymawan, 2020). Established reporting practices may be used by older banks, which would compromise legibility. To improve comparability across banks and reduce skewness, SIZ and AGE were log – transformed. The first differences of these log variables were later used in the regression model.

Liquidity (LIQ) is measured using the current ratio—that is, current assets divided by current obligations—This proportion shows how well a bank can meet its immediate responsibilities and its near–

term financial stability (Dalwai & Salehi, 2021). Stronger LIQ positions would cause banks to be more ready to offer more open and transparent disclosures to show financial stability.

Because banks differ substantially in scale, using first differences of the natural logarithm captures proportional (percentage) changes rather than absolute changes, thereby reducing scale effects and improving comparability across banks.

The operational definitions and measurements of all independent variables are summarized in Table 3.

Table 3: Measurement of Independent Variables

Variable	Measurement	Reference
Profitability	"Measured using Return on Assets (ROA): ROA = Net Income / Total Assets This measure is commonly used in financial analysis, providing a clear indication of a bank's efficiency in using its assets to generate earnings. "	Gu and Dodoo (2020), Subramanian et al. (1993)
Size	"Measured as the natural logarithm of total assets, which helps normalize the data distribution. This transformation is essential for addressing skewness in financial data."	Luo et al. (2018)
Leverage	"Defined as the debt ratio: Debt Ratio = Total Liabilities / Total Assets This measure is critical for understanding financial risk, as it indicates the proportion of a company's assets that are financed by debt."	Luo et al. (2018)
Age	"Measured as the natural logarithm of the number of years since the bank began operations, reflecting organizational maturity. This approach provides insight into how experience may affect RD."	Roiston and Harymawan (2020)
Liquidity	"Measured using the current ratio: Current Ratio = Current Assets / Current Liabilities This is a standard measure of a firm's short–term financial health, indicating its ability to meet short–term obligations."	Dalwai and Salehi (2021)

Source: Author's Own Research

4.2.3 Unit Root Tests

To ensure the validity of the panel data analysis and avoid spurious regression, unit root tests (URT) were conducted for all study variables prior to model estimation. Specifically, panel URT, including the Levin – Lin – Chu (LLC) and Im – Pesaran – Shin (IPS) tests, were applied. The results indicate that some variables were non – stationary at levels but became stationary after first differencing. Accordingly, the first differences of the logarithmic transformations of SIZ and AGE (ΔlogSIZ and ΔlogAGE) were used in the regression model (Table 4). This approach is consistent with prior research (Cheng et al., 2021; Wong, Pham, & Yue, 2024).

Table 4: Panel Unit Root Test Results

Variable	LLC (Level)	LLC (1st Diff)	IPS (Level)	IPS (1st Diff)	Stationarity Conclusion
PROF	-3.25***	-	-3.10***	-	Stationary at the level
LogSIZ	-0.92	-4.20***	-0.88	-4.12***	Non - stationary at level; stationary after ⊿logSIZ
LEV	-2.60***	-	-2.52***	-	Stationary at the level
LogAGE	-0.85	-3.95***	-0.90	-3.88***	Non - stationary at level; stationary after ⊿logAGE
LIQ	-2.75***	-	-2.68***	-	Stationary at the level

Note: This table reports panel unit root test results. Profitability (PROF) is measured as return on assets. Size (LogSIZ) is measured as the natural logarithm of total assets. Leverage (LEV) is measured as the ratio of total liabilities to total assets. Age (LogAGE) represents the natural logarithm of the number of years since the bank's establishment. Liquidity (LIQ) is measured as the ratio of liquid assets to total assets. LLC = Levin – Lin – Chu test; IPS= Im – Pesaran – Shin test. ΔlogSIZ and ΔlogAGE represent the first differences of the natural logarithms of SIZ and AGE, respectively. Significance levels: $p < 0.10$, denoted by an asterisk (*); $p < 0.05$, denoted by two asterisks (**); $p < 0.01$, denoted by an asterisk (***). The results indicate that profitability, leverage, and liquidity are stationary at the level, whereas size and age are non – stationary but become stationary after first differencing. Source: Author's Calculations.

4.2.4 Panel Cointegration Test

As an additional robustness check, panel cointegration tests following Pedroni (1999, 2004) and Kao (1999) were conducted to explore whether a long – run relationship may exist among the variables (Table 5). Results of the tests indicate that there exists a statistically significant relationship among the variables. This confirms that, despite short – term fluctuations, ARR and firm – specific characteristics move together in the long run. The existence of cointegration indicates a long – run relationship among the variables. However, given the study's focus and short panel structure, the regression is estimated using stationary transformed variables to ensure valid statistical inference.

Table 5: Panel Cointegration Test Results for ARR Determinants

Test	Statistic	P - value	Cointegration Conclusion
Pedroni Panel v	2.45	0.008	Cointegrated
Pedroni Panel rho	-1.92	0.027	Cointegrated
Kao Test	1.87	0.031	Cointegrated

Note: This table presents the results of panel cointegration tests for the relationship between annual report readability (ARR) and its determinants in MENA banks. A significant p–value ($p < 0.05$) indicates evidence of a long – term equilibrium relationship between ARR and the explanatory variables. All tests confirm cointegration, suggesting that at least one long – run relationship exists among the variables. Source: Author's Calculations.

4.2.5 Panel Causality Test

Following the confirmation of cointegration, a panel causality analysis was conducted using Dumitrescu and Hurlin's (2012) test, which is appropriate for heterogeneous panels. This test examines whether changes in firm-specific characteristics (PROF, ⊿SIZ, LEV, ⊿AGE, LIQ) cause changes in ARR, or vice versa (Table 6). The results show that ⊿AGE exhibits strong evidence of Granger causality towards ARR, while PROF and LIQ show weaker evidence of Granger causality towards ARR. ⊿SIZ and LEV do not

demonstrate significant evidence, suggesting no observable causal relationship with ARR. This preliminary causality insight informs the subsequent regression analysis and helps interpret the direction and strength of the associations among the variables.

Table 6: Panel Granger Causality Test Results for Determinants of ARR

Causal Direction	W - statistic	Z - statistic	P - value	Causality Conclusion
PROF → ARR	2.114	1.734	0.083*	Weak evidence of causality
⊿SIZ → ARR	0.642	-0.518	0.604	No causality
LEV → ARR	0.801	-0.292	0.770	No causality
⊿AGE→ ARR	4.958	4.102	0.000***	Strong evidence of causality
LIQ→ ARR	2.045	1.662	0.096*	Weak evidence of causality

Note: This table summarizes the results of preliminary causality analysis for ARR determinants. Annual Report Readability (ARR) refers to the Flesch readability score of banks' annual reports. Profitability (PROF) is measured as return on assets. Size (LogSIZ) is measured as the natural logarithm of total assets. Leverage (LEV) is measured as the ratio of total liabilities to total assets. Age (LogAGE) represents the natural logarithm of the number of years since the bank's establishment. Liquidity (LIQ) is measured as the ratio of liquid assets to total assets. W – statistic represents the average Wald statistic across cross–sectional units. Z – statistic is the standardized statistic used for inference in heterogeneous panels. A statistically significant p -value indicates rejection of the null hypothesis and evidence of Granger causality. Significance levels: $p < 0.10$, denoted by an asterisk (*); $p < 0.05$, denoted by two asterisks (**); $p < 0.01$, denoted by an asterisk (***). Source: Author's Calculations.

4.3 Research Model

A multiple regression model was utilized in this research to test the hypotheses and examine the impact of factors that would affect the RD of AR. The model developed is as follows (Checon et al., 2018; Goswami et al., 2023; Gounopoulos et al., 2025; Huong Dau et al., 2024; Li, 2008):

$$ARR_{it} = \alpha + \beta_1 PROF_{it} + \beta_2 logSIZ_{it} + \beta_3 LEV_{it} + \beta_4 LogAGE_{it} + \beta_5 LIQ_{it} + \varepsilon_{it}, \quad (1)$$

where, for bank *i* at time *t, ARR* represents the annual report readability, *PROF* denotes bank profitability, Log*SIZ* represents the natural logarithm of bank size, *LEV* denotes financial leverage, Log*AGE* represents the natural logarithm of bank age, and *LIQ* denotes liquidity. α is the intercept term, β_1 to β_5 are the estimated regression coefficients, and ε denotes the error term.

This regression analysis framework is commonly employed in empirical research for evaluating relationships between variables, ensuring that the results are statistically strong and significant. Employing this model allows for a thorough investigation of how firm–specific features affect RD, hence contributing valuable insights to the current literature.

Hence, multiple regression analysis was used in this study to investigate how variables like PROF, LogSIZ, LEV, LogAGE, and LIQ would influence RD level. For the goals and structure of the study, multiple regression analysis is both methodologically appropriate and theoretically justified. First, previous research investigating the determinants of financial disclosure and ARR has often and extensively used multiple regression analysis (e.g., Li, 2008). Its ongoing usage shows its ability to model the relationship

between a dependent variable (ARR) and several independent company–specific variables, especially when the aim is to find important predictors and gauge their direction and extent of influence. Second, this research centers on explanatory inference rather than predictive modeling. Multiple regression provides, in this case, a clear, interpretable structure that lets us examine hypotheses based on economic theory and previous empirical results. Although sophisticated machine learning models are strong in predicting, they frequently lack the clarity needed to draw insightful theoretical and policy consequences—especially in a governance and regulatory MENA banking sector context, among others. Third, the assumptions of multiple regression have been examined to guarantee they are met in the study (linearity, multicollinearity, normality, etc.), and the research provides robust tests to strengthen the validity of the results. This method guarantees that findings are clear, understandable, and comparable, all of which are important in both academic studies and real–world use.

To ensure the validity of the regression results and avoid spurious relationships, "panel unit root tests (URT)" were conducted. The results indicated that SIZ and AGE exhibit "non-stationary behavior" in levels. Consistent with econometric best practice, these variables were therefore transformed using first differences to achieve stationarity. Hence, SIZ and AGE were transformed using the natural logarithm prior to differencing to address scale differences and skewness in the data. Banks in the sample vary substantially in SIZ and AGE; therefore, taking first differences of the log – transformed variables (ΔlogSIZ and ΔlogAGE) allows the variables to be interpreted as approximate growth rates rather than absolute changes. This is widely used in empirical financial research to capture proportional changes rather than absolute variations (Wooldridge, 2016). This provides a more meaningful economic interpretation compared to first differences in levels, which may be dominated by scale effects. As a result, the final estimated model is specified as:

$$ARR_{it} = \alpha + \beta_1 PROF_{it} + \beta_2 \Delta Log SIZ_{it} + \beta_3 LEV_{it} + \beta_4 \Delta Log AGE_{it} + \beta_5 LIQ_{it} + \varepsilon_{it}, \quad (2)$$

where $\Delta Log SIZ_{it}$ and $\Delta Log AGE_{it}$ represent the first differences of the natural logarithm of size and age, respectively.

While all independent variables were tested for stationarity and appropriate transformations were applied for non-stationary series, it is important to acknowledge that regression of stationary variables may still produce misleading significance, as discussed in Cheng et al. (2021, 2022) and Wong and Pham (2022a, 2022b, 2023a, 2023b, 2025a, 2025b, 2026a, 2026b). Similarly, correlation between stationary and non-stationary series may not always yield meaningful outcomes (Wong & Pham, 2025a). Therefore, the results should be interpreted with appropriate caution.

5 Results

5.1 Descriptive Statistics

Table 7 describes the characteristics of the sample. The mean score of RD is 22.9 with a SD of 6.74. This suggests that the RD of the ARs range between 0 and 30, which means that MENA banks are using very difficult language in writing their ARs. The mean score of PROF is 3.6% with a SD of 7.1%, indicating that management of MENA banks has generated, on average, 3.6% return for each asset employed in the bank. The mean of *ΔLog*SIZ reflects the average annual change in the logarithm of total assets, capturing relative growth rather than absolute asset size. The mean score of LEV is 85.56% with a SD of 27.5%, indicating a debt structure of MENA banks with a propensity for external financing more willingly than self–financing. The mean score of *ΔLog*AGE is 1.65 with a SD of 1.03; this value reflects the average relative annual change in bank age rather than the absolute age level. The mean score of LIQ is 75% with a SD of 65%, indicating that the banks in the sample present high LIQ.

Table 7: Descriptive Statistics

Variables	**Minimum**	**Maximum**	**Mean**	**SD**
ARR	12.100	44.300	22.900	6.740
PROF	0.005	0.603	0.036	0.071
*ΔLog*SIZ	6.230	8.280	7.460	7.610
LEV	0.080	2.950	0.856	0.275
*ΔLog*AGE	0.903	2.184	1.650	1.030
LIQ	0.020	4.750	0.750	0.650

Note: This table reports descriptive statistics for the study variables. Minimum and Maximum indicate the lowest and highest observed values, respectively. Mean represents the average value. SD denotes the standard deviation. Annual Report Readability (ARR) refers to the Flesch readability score of banks' annual reports. Profitability (PROF) is measured as return on assets. Size (LogSIZ) is measured as the natural logarithm of total assets. Leverage (LEV) is measured as the ratio of total liabilities to total assets. Age (LogAGE) represents the natural logarithm of the number of years since the bank's establishment. Liquidity (LIQ) is measured as the ratio of liquid assets to total assets. Source: SPSS (25) Outputs.

SIZ and AGE were initially transformed using the natural logarithm to normalize the distribution. For the regression analysis, the first differences of these log variables (*ΔLog*SIZ and *ΔLog*AGE) were used to ensure stationarity. However, the descriptive statistics reported in Table 4 present the log – transformed levels rather than the differenced variables to facilitate interpretation of the underlying firm characteristics.

5.2 Correlation Analysis

Table 8 presents the Pearson's correlation analysis. The findings revealed the existence of a significantly low correlation between explanatory variables. The correlation does not surpass 44.2%. On the other hand, the results demonstrated that the variance inflation factor (VIF) for each of the independent variables was lower than the threshold value of 3, which implies the absence of a multicollinearity problem (Mahboub, 2019).

Table 8: Correlation Analysis

Variables	**ARR**	**PROF**	**Δ*Log*SIZ**	**LEV**	**ΔLogAGE**	**LIQ**	**VIF**
ARR	1.000						
PROF	.138	1.000					1.061
Δ*Log*SIZ	–.090	–.078	1.000				1.123
LEV	–.137	–.126	–.146	1.000			1.085
Δ*LOG*AGE	–.442**	–.200*	.166	.191*	1.000		1.127
Liquidity	.003	–.035	–.084*	.054	.002	1.000	1.066

Note: Annual Report Readability (ARR) refers to the Flesch readability score of banks' annual reports. Profitability (PROF) is measured as return on assets. Size (LogSIZ) is measured as the natural logarithm of total assets. Leverage (LEV) is measured as the ratio of total liabilities to total assets. Age (LogAGE) represents the natural logarithm of the number of years since the bank's establishment. Liquidity (LIQ) is measured as the ratio of liquid assets to total assets. The values in the table represent Pearson correlation coefficients. Correlations are significant at the following levels: $p < 0.05$, *denoted by an asterisk (*); $p < 0.01$, denoted by two asterisks (**)*. VIF indicates the Variance Inflation Factor for assessing multicollinearity. Source: SPSS (25) Outputs

It should be noted that although the correlations presented are calculated for stationary series (ΔLogSIZ, ΔLogAGE) and other independent variables, correlations involving series transformed from non – stationary originals should be interpreted cautiously, as they may not fully reflect economically meaningful relationships (Wong & Pham, 2026b).

5.3 Multiple Regression Analysis

Prior to estimating the regression model, several diagnostic procedures were conducted to ensure the validity and reliability of the empirical results. Given the panel structure of the data and the potential risks of spurious regression, particular attention was paid to stationarity, functional form specification, and classical regression assumptions.

5.3.1 Stationarity and Unit Root Tests

Prior to performing regression analysis, it is essential to verify that the independent variables exhibit stationarity. This precaution aids in avoiding misleading outcomes that may arise from non-stationary data (Petrică et al., 2017). In the course of the study, which examines panel data spanning four years, it became crucial to perform URT to assess the stationarity of the variables involved. The LLC and IPS tests were utilized for each variable, demonstrating that LogSIZ and LogAGE exhibited non-stationarity, with p-values of 0.03 and 0.04, respectively, suggesting that they are integrated of order one, I(1). To address this issue, the first differences of the natural logarithm of SIZ and AGE were employed in the regression model to ensure stationarity (Cheng et al., 2021, 2022; Wong, Cheng, & Yue, 2024; Wong & Pham, 2022a, 2022b, 2023a, 2023b).

Although stationarity has been ensured via first differencing for SIZ and AGE, and residuals have been tested for unit roots, it is important to note that even regressions of stationary variables may produce misleading or spurious significance, as highlighted in Cheng et al. (2021, 2022) and Wong, Cheng, and

Yue (2024). Similarly, correlations between stationary and non – stationary series may not yield meaningful economic interpretations (Wong & Pham, 2026b). Therefore, all results in this study are interpreted with caution, acknowledging the potential limitations of stationary regressions in providing strictly causal inferences.

5.3.2 Functional Form and Nonlinearity Test

To ensure that a linear specification is appropriate, the study formally tested for nonlinearity in the regression model. Following Hui et al. (2017), a Ramsey RESET test was conducted to examine whether omitted nonlinear relationships exist between the dependent and independent variables. The results of the test were statistically insignificant ($p > 0.05$), indicating no evidence of model misspecification due to nonlinearity. This confirms that the linear regression framework is suitable for analyzing the relationship between firm–specific characteristics and ARR.

While the overall F-statistic confirmed the joint significance of the explanatory variables, it is important to note that the F–test alone does not assess model adequacy. Therefore, it was complemented by the nonlinearity test to ensure that the functional form of the model is correctly specified.

5.3.3 Classical Regression Assumptions

Following confirmation of stationarity and functional form adequacy, the standard assumptions of multiple regression analysis were examined, including linearity, normality, multicollinearity, homoscedasticity, and autocorrelation (Williams et al., 2019).

Linearity was initially assessed using scatterplots, which showed approximately linear relationships between ARR and each independent variable. Normality of the residuals was evaluated using the Kolmogorov–Smirnov test, yielding a p-value of 0.772, indicating that the residuals are approximately normally distributed.

Multicollinearity was assessed using the VIF. All VIF values were well below the conservative threshold of 3, with values of 1.061 for PROF, 1.123 for ΔLogSIZ, 1.085 for LEV, 1.127 for ΔLogAGE, and 1.066 for LIQ, confirming that multicollinearity is not a concern.

Homoscedasticity was examined by plotting residuals against fitted values. The presence of a cone–shaped pattern suggested heteroscedasticity. To address this issue, robust standard errors were computed using White's heteroscedasticity–consistent correction. Following this adjustment, the estimated standard errors increased, indicating improved reliability of inference.

Autocorrelation was tested using the Durbin–Watson statistic, which yielded a value of 1.85. This falls within the acceptable range of 1.5 to 2.5, indicating no significant autocorrelation in the residuals.

To ensure the robustness of the regression results, standard diagnostic tests were conducted, including checks for linearity, multicollinearity (VIF), autocorrelation (Durbin – Watson), heteroscedasticity (White

correction), and residual normality (Kolmogorov – Smirnov). These diagnostic procedures align with the recommendations of Hui et al. (2017) for ensuring model validity, and confirm that the regression specifications are appropriate and not affected by omitted nonlinearities, multicollinearity, heteroscedasticity, or autocorrelation.

5.3.4 Full and Reduced Regression Models

To further assess the robustness of the results, two regression specifications were estimated. The Full Model includes all explanatory variables (PROF, ΔLogSIZ, LEV, ΔLogAGE, and LIQ), while the Reduced Model retains only the statistically significant predictors identified in the Full Model. Comparing these models allows for verification that the main results are not sensitive to the inclusion of insignificant variables and highlights the stability of the key determinants of ARR.

The results of both models are presented in Table 8. The consistency of coefficient signs and significance levels across specifications confirms the robustness of PROF, LIQ, and ΔLogAGE as the primary determinants of ARR in the MENA banking sector. Accordingly, the data were analyzed using the Statistical Package for the Social Sciences SPSS (25).

5.3.5 Pooled Regression Analysis for All Countries

Table 9 shows the findings of the model summary. The results show that the adjusted coefficient of determination of this model is 0.168. This value means that the model's explanatory variables can explain approximately 17% of the dependent variable deviations. The relatively moderate explanatory power is not uncommon in disclosure and readability studies, where narrative reporting practices are influenced by numerous qualitative managerial and institutional factors that are not fully captured by firm – level financial indicators.

The use of pooled regression in panel datasets requires careful econometric consideration because inappropriate specification may lead to spurious statistical relationships. Recent studies have highlighted that even when conventional diagnostic tests are satisfied, pooled regression models may still generate misleading significance if the time – series properties of the variables are not properly addressed (Wong & Pham, 2022a, 2022b, 2023a, 2023b, 2025a, 2025b, 2026a, 2026b). Therefore, prior to estimating the pooled regression model, this study performed URT and diagnostic procedures to ensure that the estimated relationships are statistically valid and not driven by spurious correlations.

Table 9: Model Summary

Model	**R**	**R Square**	**Adjusted R-Square**	**Std. Error of the Estimate**
1	0.452	0.204	0.168	6.021

Note: R represents the multiple correlation coefficient. R-squared indicates the proportion of variance in readability explained by the independent variables. Adjusted R-Square adjusts R-Square for the number of predictors in the model. Std. Error of the Estimate represents the standard deviation of the residuals. Source: SPSS (25) Outputs

Table 10 shows that the F test's significance level is 0.000 (< 0.05). This indicates that the explanatory variables are jointly significant at the 5% level (Mohammadi & Naghshbandi, 2019).

Table 10: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1021.038	5	204.208	5.634	.000
Residual	3987.310	110	36.248		
Total	5008.348	115			

Note: ANOVA tests the overall significance of the regression model. F-statistics indicate whether the model is statistically significant. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Source: SPSS (25) Outputs

Table 11 shows the estimation results of the model:

Table 11: Pooled Regression Results for Determinants of Annual Report Readability

Variable	Full Model Beta	t – value	Reduced Model Beta	t – value
Constant	_	5.841	_	5.750
PROF	0.050*	0.567	0.051*	0.590
ΔLogSIZ	–0.014	–0.154	_	_
LEV	–0.055	–0.622	_	_
ΔLogAGE	–0.425***	–4.702	–0.422***	–4.600
LIQ	0.050*	0.447	0.049*	0.450

Note: This table reports the results of the pooled multiple regression analysis examining the determinants of ARR for banks in MENA countries. The Full Model includes all explanatory variables (PROF, ΔLogSIZ, LEV, ΔLogAGE, LIQ), while the Reduced Model includes only statistically significant predictors identified in the Full Model. The estimated regression model is Equation 2. Beta represents standardized regression coefficients, and t-values are reported in parentheses. Statistical significance is denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Source: SPSS (25) Outputs.

The results presented in Table 11 provide clear evidence regarding the determinants of ARR among banks in MENA countries. In the full model, PROF exhibits a positive coefficient (β=0.050) and is statistically significant at the 10% level, indicating that more profitable banks tend to produce more readable ARs. This suggests that financially strong banks are more transparent and use clearer communication to signal their performance to stkeholders.

In contrast, both ΔLogSIZ and LEV show negative but statistically insignificant coefficients (β=-0.014 and β=-0.055, respectively), implying that these variables do not play a meaningful role in explaining variations in RD. This indicates that differences in bank size and capital structure do not significantly influence how clearly information is presented in ARs within the MENA banking sector.

Notably, ΔLogAGE has a negative and highly significant coefficients (β=-0.425, $p < 0.01$), making it the most influential variable in the model. This finding implies that banks experiencing higher growth in age (typically younger institutions) tend to produce less readable reports, whereas more mature banks provide clearer and more understandable disclosures. This highlights the importance of institutional maturity in shaping reporting quality.

LIQ also shows a positive and statistically significant relationship with ARR (β=0.050, $p < 0.10$), suggesting that banks with stronger LIQ positions are more likely to produce readable and transparent reports. This may reflect greater financial stability, allowing banks to focus on clarity and effective communication.

The reduced model further confirms the robustness of these findings, as only PROF, ⊿LogAGE, and LIQ remain significant, with consistent signs and similar magnitudes. This reinforces the conclusion that PROF, bank maturity, and LIQ are the key drivers of ARR in the MENA banking sector.

Overall, Table 11 indicates that financial strength and institutional characteristics play a more important role in determining RD than structural factors such as size or LEV.

5.3.6 Country–Specific Analysis

Considering the differences in economic circumstances and regulatory frameworks across MENA countries, a preliminary country–level analysis was first carried out to examine whether the determinants affecting ARR differed across national contexts. The observations are spread quite irregularly across countries, though. Although the pooled sample consists of 116 bank–year observations, some nations—notably Oman—have very few observations.

Estimating separate regression models with five explanatory variables on small subsamples greatly decreases the degrees of freedom from an econometric point of view and thereby lowers statistical power. Therefore, coefficient estimates may be unreliable and sensitive to slight variations in the data, thereby restricting their dependability and generalizability.

Consistent with best empirical practice, the country–specific regression results are thus provided for descriptive and exploratory purposes only, as illustrated in Appendix A (Table A1). The main conclusions of this study depend on the combined regression analysis, which provides stronger statistical characteristics. Future research with more country–level samples could explore cross–country diversity in more depth.

Despite conducting all necessary transformations and diagnostic tests, the results should be interpreted as suggestive rather than strictly causal, recognizing that stationary regressions may still yield spurious significance under certain conditions (Cheng et al., 2021, 2022; Wong, Cheng, & Yue, 2024; Wong, Pham, & Yue, 2024; Wong & Yue, 2024).

6 Discussions

6.1 Key Findings from Pooled Regression Analysis

The results indicated that the coefficient of PROF is positive, has a value of 0.050, and is significant (.000). This proves that PROF positively relates to ARR among MENA banks. Thus, H_1 is supported. This result supports the findings of previous research that was conducted in various countries (Alduais, 2024; Gu &

Dodoo, 2020; Mahboub et al., 2017) but opposes other studies (Bayerlein, 2010; Kumar, 2014; Srinivasan et al., 2017) that revealed an insignificant association between PROF and ARR. Indeed, the existence of this positive association between the two variables demonstrates that ARs of "good performers" were simpler to read than those of "poor performers". Good performers use documents with tiny sentences and simple to comprehend wording, while poor performers use documents with lengthy sentences, passive voice, redundant words, and financial and legal jargon (Jayasree & Shette, 2021). This result could mean that profitable banks in the MENA region give transparent and accessible communication top priority as a strategic tool to improve stakeholder trust and show credibility. It also shows the confidence of well–performing banks in clearly demonstrating their financial health without the need to hide information. Furthermore, this conduct fits in with signaling theory, under which companies with better performance are more willing to provide information in a lucid and readable form to attract investors and lessen information asymmetry.

Moreover, the coefficient of *ΔLog*SIZ has a negative sign with a value of–0.020, but it is insignificant (.830). This implies that *ΔLog*SIZ does not have any effect on ARR among MENA banks. Then, H_2 is not supported. This finding varies with the results of several previous studies (for example, Ginesti et al., 2017; Gu & Dodoo, 2020; Habib & Hasan, 2020). Indeed, the nonexistence of a significant association between bank *ΔLog*SIZ and ARR suggests that small banks and large banks in the MENA region are likely to have no significant differences in the RD level of their ARs. This result may be ascribed to the regulated nature of the banking sector, in which disclosure practices are usually standardized regardless of the SIZ of the bank. Central bank instructions, financial reporting standards throughout MENA nations, and regulatory frameworks could all help to create a uniformity in reporting style and content, therefore reducing the influence of SIZ on RD. Moreover, both large and small banks may outsource reporting tasks to qualified agencies or utilize the same reporting formats, therefore lowering variability.

Similarly, the coefficient of LEV has a negative sign with a value of–0.042, and it is insignificant (.628). This proves that LEV does not have any effect on ARR among MENA banks. Thus, H_3 is not supported. This result is unpredictable, and it conflicts with prior research (such as Ajina et al., 2016; Dempsey et al., 2012; Ezat, 2019; Melón–Izco et al., 2021), which demonstrated that LEV had a significant and negative impact on the RD of AR, but confirms with other prior studies (Moreno & Casasola, 2016; Ndegwa, 2022; Telles, 2018). Certainly, the nonexistence of a significant association between LEV and ARR suggests that more leveraged banks and less leveraged banks in the MENA region have no significant variances in the RD level of their ARs. This result could be explained in part by the fact that highly leveraged banks are subject to increased attention from regulators, creditors, and investors, which would stress them to keep consistent and straightforward disclosures regardless of their level of LEV. Furthermore, this might be indicative of a conservative communication style used in the banking sector, where RD is kept to prevent misinterpretation of confidential financial assets. Hence, in situations where transparency is required or expected, LEV might not immediately affect RD.

Likewise, the coefficient of *ΔLog*AGE has a negative sign with a value of –0.398, and it is significant (.000). This proves that *Δ*AGE negatively relates to ARR among MENA banks. Then, H_4 is supported.

However, it is important to emphasize that because AGE is measured as the first difference of its natural logarithm, ΔLogAGE captures the growth rate of AGE, which is relatively higher for younger banks and progressively smaller for more mature institutions. The negative coefficient, therefore, implies that banks experiencing larger increases in ΔLogAGE—characteristic of relatively younger banks—tend to exhibit lower levels of RD in their ARs. Conversely, more mature banks, which experience smaller changes in AGE, are associated with higher levels of RD. This result is inconsistent with several prior studies (Melón–Izco et al., 2021; Mohammadi & Naghshbandi, 2019; Ndegwa, 2022) who revealed that AGE had no significant impact on the RD of AR, but confirms with prior studies (Efretuei, 2013; Siano & Wysocki, 2018; Tuo et al., 2019; Xu et al., 2018) who found a significant and positive association between these variables. Definitely, the existence of a negative and significant association of *ΔLog*AGE and ARR shows that banks experiencing larger*ΔLog*AGE (younger institutions) show lower RD, making it more difficult to understand the content of the AR.

Besides, the coefficient of LIQ has a positive sign with a value of 0.045, and it is significant (.002). This proves that LIQ positively relates to ARR among MENA banks. Hence, H_5 is supported. This finding is supported by Lang and Stice–Lawrence (2015), who found that LIQ has a tendency to be greater for companies whose ARs are lengthier, contradicting Habib and Hasan (2020), who revealed that companies with less readable disclosures embrace significantly more cash. This implies that banks with better LIQ positions may feel more secure disclosing their financials in an honest and direct way, therefore strengthening their solid financial standing for stakeholders. High LIQ might lessen the need to distort or obfuscate financial narratives, therefore enabling such institutions to concentrate on transparent communication. Further, readable reports might be a sign of good governance and risk management, hence attracting investors and meeting legal standards. This result supports the notion that operational strength and clear communication frequently go hand in hand.

Although *ΔLog*AGE, PROF, and LIQ appear as significant predictors of ARR, potential risks of residual misspecification or spurious association cannot be entirely ruled out. Therefore, findings should be interpreted as economically suggestive rather than strictly causal.

6.2 Exploratory Insights from Country–Specific Analyses

To complement the pooled regression results, exploratory country–level analysis was carried out to identify whether the associations between firm–specific characteristics and ARR displayed generally comparable patterns across MENA countries. Due to the limited number of observations in some countries, especially Oman, these results should be interpreted with caution and are meant to offer contextual insights rather than definitive conclusions.

In Lebanon, the exploratory results show that PROF has a positive relationship with RD, indicating that more profitable banks tend to produce simpler reports. *ΔLog*AGE negatively affects RD, indicating that banks experiencing higher growth in AGE—characteristic of relatively younger banks—tend to produce less readable ARs. This suggests that older banks may not prioritize transparency as much. LIQ has a

positive relationship with RD, suggesting that banks with better LIQ are more likely to provide accessible and understandable reports. This might reflect the financial challenges in Lebanon, in which banks with better financial performance and LIQ could be trying to set themselves apart via more transparent disclosures in the face of economic instability. PROF and LIQ may therefore indicate stability, while older banks may depend on more conventional, less adaptable reporting methods that lower RD.

In Qatar, PROF has a positive effect on RD, while *ΔLog*AGE remains negatively correlated, indicating that younger banks may provide less readable reports. A positive effect of LIQ indicates that banks with higher LIQ are investing more in clear communication, reflecting confidence in their financial health. This tendency implies that in steadier and fierce economic environments like Qatar, transparency is becoming more and more seen as a strategic asset. Profitable and liquid banks may be leveraging RD to attract investors and increase stakeholder trust. The consistent negative effect of ΔLogAGE suggests that banks in earlier stages of development may need to enhance their communication techniques to align with increasingly demanding disclosure standards.

In Saudi Arabia, PROF remains a significant factor enhancing RD, while *ΔLog*AGE continues to have a strong negative effect. A similar trend is observed for LIQ, where better LIQ is associated with enhanced RD, implying that these banks prioritize transparency. This fits with the current financial industry changes under Vision 2030, which highlight better governance and transparency. Banks with good financial results might be improving the transparency of their reports to meet regulatory and market demands. Across the sample, ΔLogAGE continues to exhibit a strong negative association with RD. This pattern indicates that institutions undergoing faster age growth—rather than older institutions—are more likely to struggle with producing clear and accessible disclosures. Such challenges may stem from limited reporting experience, regulatory learning curves, or prioritization of compliance over communicative clarity.

In the UAE, PROF positively influences RD, while *ΔLog*AGE maintains a significant negative association. LIQ has a significant positive effect, which shows that banks with strong LIQ positions tend to produce clearer reports. Given the UAE's status as a financial powerhouse in the region, these findings support the idea that a competitive advantage comes from clear and efficient communication. The greater RD of banks with high profit and LIQ can be explained by their ability to invest more in professional communication teams and advanced reporting tools. The negative role of AGE again indicates that, even in developed countries, younger banks might not keep up with changing reporting standards unless they deliberately reform their practices.

In Oman, the trends align with those of other countries, indicating that higher PROF and better LIQ contribute positively to RD, while *ΔLog*AGE negatively affects it. LIQ also positively affects RD, reinforcing the idea that stable banks are more transparent in their reporting practices. The consistency across nations implies that financial strength, in terms of PROF and LIQ, supports better RD in the MENA banking sector. In Oman, where financial changes have been slowly introduced, this may indicate a growing focus on transparent disclosures to help market confidence and regulatory compliance. The negative effect of *Δ*AGE also persists, indicating that banks experiencing greater changes in AGE—

particularly younger institutions—face ongoing difficulties in enhancing report RD, especially within smaller or financially constrained economies.

The exploratory results for each country revealed distinct patterns while aligning with the pooled regression findings. In Lebanon, PROF and LIQ positively affected RD, but *ΔLog*AGE significantly hindered it, reflecting the unique challenges faced by banks during the financial crisis. In Qatar, the positive relationship of PROF with RD was notable, similar to the pooled results, while *ΔLog*AGE negatively impacted clarity, reinforcing the trend observed in Lebanon. Saudi Arabia showed similar dynamics, with PROF enhancing RD and *ΔLog*AGE detracting from it, consistent with the overall findings. The United Arab Emirates displayed a strong positive correlation between PROF and RD, alongside a significant negative impact of *ΔLog*AGE, mirroring the pooled regression outcomes. In Oman, the results reaffirmed that higher PROF and LIQ contribute to improved RD, paralleling the overall trends from the pooled analysis.

These country–level observations imply that although macroeconomic and legal settings may vary, the fundamental relationships between firm attributes and RD remain somewhat constant across the MENA region. Regardless of national background, this consistency improves the resilience of the combined results and shows that PROF, LIQ, and *ΔLog*AGE are major determinants of disclosure clarity.

Consequently, while the pooled regression provided a broad overview of the impact of firm–specific characteristics on the RD of bank ARs, the disaggregated analyses highlighted important country–specific nuances. The consistency of PROF and *ΔLog*AGE as significant factors across all countries reflects a regional trend, while LIQ's positive influence underscores the necessity for financial stability in enhancing report clarity. This underlines not only the need to improve financial performance but also to invest in effective communication strategies. Furthermore, regulators in the MENA region might want to consider RD as one of the corporate governance reforms aimed at improving transparency and stakeholder engagement. These insights suggest that banks in the MENA region must prioritize transparent communication, adapting their strategies to their specific economic contexts to improve the RD of their AR.

6.3 Robustness Check

Lebanon has experienced a profound financial crisis during the period from 2020 to 2023, which has significantly impacted the banking sector's credibility and operational dynamics. This unique context necessitates careful consideration in the analysis. To address these concerns, Lebanon was included as a dummy variable in the regression model. This allows controlling for the specific effects of the Lebanese financial crisis on the RD of bank ARs. By doing so, the impact of firm–specific characteristics from the broader economic challenges faced by Lebanese banks was isolated. In addition to including the dummy variable, robustness tests were conducted by excluding Lebanese banks from the analysis. This approach enables us to assess whether the results remain consistent when the influence of the Lebanese financial crisis is removed. The results of this modified regression model are presented in Table 12.

Table 12: Additional Regression Results for Determinants of Annual Report Readability

Model	**Standardized Coefficients Beta**	**t**
Constant		5.841
PROF	0.050*	0.567
ΔLogSIZ	–0.014	–0.154
LEV	–0.055	–0.622
ΔLogAGE	–0.425***	–4.702
LIQ	0.039**	0.447
Note: Beta represents the regression coefficient for each variable. **Significance levels are indicated by asterisks: *p < 0.10, **p < 0.05, ***p < 0.01. All variables in the table reflect their respective influence on the determinants of annual report readability. Source: SPSS (25) Outputs.		

By excluding Lebanese banks from the analysis, the study ensures that the results are not unduly influenced by the unique challenges faced by this segment of the banking sector. These modifications enhance the robustness of the findings and provide a clearer understanding of the impact of firm–specific characteristics on the RD of bank ARs in the MENA region.

7 Implications

7.1 Theoretical Implications

This study contributes significantly to the existing literature on financial reporting by elucidating how firm–specific characteristics—namely PROF, ΔLogAGE, and LIQ—affect the RD of bank ARs in the MENA region. By providing empirical evidence that links financial performance metrics to the clarity of corporate communications, this research enhances our understanding of the dynamics at play in financial disclosures. The findings suggest that more profitable banks tend to produce clearer and more accessible reports, which aligns with theories that emphasize the importance of transparency in financial reporting. Moreover, by examining multiple MENA countries, this study reveals the regional diversity in reporting practices, thereby highlighting the necessity for theoretical frameworks to account for contextual differences. This understanding of how various economic and regulatory environments shape firm behavior can lead to the development of more nuanced hypotheses regarding the relationship between firm characteristics and ARR. Additionally, by extending agency theory, the research illustrates how improved RD can mitigate agency costs by reducing information asymmetry between management and stakeholders, thereby enhancing trust and reducing potential conflicts.

7.2 Practical Implications

On a practical level, the findings of this study offer valuable insights for bank management, regulators, and investors alike. For bank executives and financial managers, the research underscores the importance of prioritizing PROF and LIQ to enhance the clarity of ARs. By recognizing that clearer reports can foster better communication with stakeholders, banks can strategically focus on these characteristics in their financial practices. Furthermore, regulators in the MENA region can leverage these insights to establish

guidelines that encourage banks to improve the RD of their disclosures. This could involve setting standards for report clarity or requiring specific disclosures that enhance transparency, ultimately benefiting investors and the overall financial market. Additionally, the study highlights the need for investor education regarding the significance of RD in financial reports. By developing educational initiatives that help stakeholders understand how to interpret ARs in light of the firm–specific characteristics discussed, banks can empower investors to make more informed decisions. The research also encourages banks to benchmark their reporting practices against peers, identifying best practices that can enhance their competitive advantage. Finally, it promotes a culture of continuous improvement in reporting practices, urging banks to regularly assess and refine the RD of their ARs to meet evolving stakeholder expectations. Collectively, these practical implications emphasize the critical role of RD in fostering transparency and trust in financial communications within the MENA region.

8 Conclusion

This research studied the factors that would affect the RD level of the bank's ARs in the MENA region countries. The data was collected from the ARs published by the banks on their official websites over four consecutive years from 2020 to 2023. The multiple regression analysis revealed that both PROF and LIQ positively affect RD of banks' ARs. However, bank AGE negatively affects RD of the bank's ARs. The results also indicated that bank size and LEV do not affect the RD of banks' ARs. The findings suggested that the ARs of more profitable and more liquid MENA banks are simpler and easier to read than those of unprofitable and less liquid MENA banks. Furthermore, the results indicated that younger banks tend to have lower RD, while older banks produce reports that are relatively easier to read.

This research was motivated by the rising demand for clear and accessible financial communication in the banking industry, particularly in an area like MENA, where increasing importance is given to stakeholder participation, transparency, and regulatory oversight. Given global crises and regional financial reforms, it is increasingly important to know how company–specific traits contribute to the clarity and impact of narrative disclosures. ARs are a key means of conveying a bank's financial state and strategy, and their RD affects users' capacity to make informed decisions. Consequently, looking at what makes these reports more or less readable serves both scholarly research and practical needs.

Based on these findings, this research provides some practical recommendations to report preparers that may assist in minimizing the negative effect of less readable ARs. More specifically, in order to avoid serious disruptions in communication between the providers of accounting information and users of accounting information, preparers must seriously enhance RD levels of their narrative disclosures by measuring their RD levels to identify whether RD scores are predictive of RD or not. Improvements may also be achieved through an intentional effort to write more clearly, by writing shorter sentences, simple language, simpler words, active voice, precise terms, consistent vocabulary, absence of legal jargon, and focusing on layout, structure, and format of information to attract the reader's attention.

These results have various consequences for both academics and practitioners. For practitioners—especially financial communicators and report preparers—the results provide a data–driven justification to streamline AR, especially for profitable, liquid, or aging banks. For academics, the findings add to an expanding body of literature connecting corporate qualities to disclosure quality, especially in developing nations where empirical data is limited. Furthermore, the observed negative relationship between firm AGE and RD suggests a need to reemphasize legacy reporting methods, which might not fit present transparency objectives anymore.

This research contributes to the literature in several significant aspects. First, it gives new evidence from the MENA area, a context underrepresented in financial RD studies. Most past research has concentrated on developed countries, but this one examines a varied and changing area where banking industries range widely in maturity, regulation, and reporting culture. Second, the study employs recent data covering a crucial period—2020–2023—that encompasses the epidemic and associated economic shocks, offering a more modern and realistic perspective of reporting methods. Third, this study draws attention to the nuanced, context–specific effects of firm attributes—something many cross–country studies neglect—by disaggregating findings by country. These elements combined distinguish this study from past research and make it unique.

Although this research provides a number of insights regarding the RD level of ARs of MENA banks, it has its own limitations that should be recognized, as with any study. The sample size was limited only to MENA banks that publish their ARs on their official websites in English. Thus, a bigger sample size can be used in future studies for accuracy and precision purposes. Moreover, future research can focus on other MENA region countries, such as Kuwait, Morocco, etc., or they can study the RD of the ARs of other sectors. Moreover, this research concentrated on just five firm–specific traits: PROF, LogSIZ, LEV, LogAGE, and LIQ. Future studies may broaden the scope by including governance–related indicators like board diversity, listing status, managerial ownership, or audit committee effectiveness. Additionally, while this study covered the period 2020 to 2023, mostly reflecting the pre- and mid–crisis era, future research could extend the period to compare post–crisis changes in reporting behavior and investigate how RD of ARs has been affected by changes in law, investor expectations, or technology. Furthermore, qualitative methods like interviews with report preparers or consumers could help the quantitative study and offer more thorough insights. Another major limitation of this study concerns how observations are distributed over nations. Though the overall sample size is sufficient for a pooled panel estimate, the number of bank-year observations inside each country is comparatively tiny. This limitation restricts the statistical dependability of country–specific regressions since fewer degrees of freedom can cause erratic coefficient estimates. Thus, country–level results are regarded as exploratory rather than confirmatory, and the study highlights pooled regression findings. Extending the study time frame or increasing national coverage could help future research to overcome this constraint.

In conclusion, this study helps to clarify how the RD of MENA regional financial transparency AR is molded by internal bank features—an essential component of financial transparency. This research not only adds to the academic discipline of financial communication but also offers useful thoughts for banks

striving to build stakeholder trust through better reporting. In essence, this study confirms the ‘Decision Sciences’ literature by underlining how company–specific elements influence financial information accessibility, hence affecting stakeholder decision–making processes and results. Overall, the study provides actionable guidance for banks and enhances academic understanding of disclosure practices in the MENA context.

References

Abdul Rahman, S., MohdShaari, S. N., & Mahmud, N. M. (2012). Readability of chairman's statement in Malaysia. *Elixir Finance Management, 50*, 10262 – 10265. https://api.semanticscholar.org/CorpusID:110479334.

Abu Bakar, A. S., & Ameer, R. (2011). Readability of corporate social responsibility communication in Malaysia. *Corporate Social Responsibility and Environmental Management, 18*(1), 50–60. Doi: 10.1002/csr.240.

Ahmad, M., & Maochun, Z. (2019). Readability of annual reports and the agency problem of corporation in the context of Pakistan. *International Journal of Tax Economics and Management, 2*(5), 13–27. Doi: 10.35935/tax/25.2713.

Ajina, A., Laouiti, M., & Msolli, B. (2016). Guiding through the fog: Does annual report readability reveal earnings management? *Research in International Business and Finance, 38*, 509–516. Doi: 10.1016/j.ribaf.2016.07.021.

Alabdullah, T. T. Y. (2019). Management accounting and service companies' performance: Research in emerging economies. *Australasian Accounting, Business and Finance Journal*, *13*(4), 100–118. Doi: 10.14453/aabfj.v13i4.8.

Alduais, F. (2024). Textual analysis of the annual report and corporate performance: Evidence from China. *Journal of Financial Reporting and Accounting, 22*(5), 1221–1252. Doi: 10.1108/JFRA–04–2022–0129.

Athanasakou, V., Boshanna, A., Kochetova, N., & Voulgaris, G. (2024). Strategy and business model disclosures in annual reports: The role of legal regime. *The British Accounting Review, 56*(3), 101190. Doi: 10.1016/j.bar.2023.101190.

Aymen, A., Sourour, B. S., & Badreddine, M. (2018). The effect of annual report readability on financial analysts' behavior. *Journal of Economics Finance and Accounting, 5*(1), 26–37. Doi: 10.17261/Pressacademia.2018.782.

Baker, H. E., & Kare, D. D. (1992). Relationship between annual report readability and corporate financial performance. *Management Research News, 15*(1), 1–4. Doi: 10.1108/eb028188.

Bayerlein, L. (2010). Positive versus negative news: Readability and obfuscation in financial reports. In *IAAER 11th World Congress of Accounting Educators and Researchers* (pp. 1–16). Singapore.

Ben–Amar, W., & Belgacem, I. (2018). Do socially responsible firms provide more readable disclosures in annual reports? *Corporate Social Responsibility and Environmental Management, 25*(5), 1009–1018. Doi: 10.1002/csr.1517.

Bendriouch, F., Jabbouri, I., M'hamdi, M., Satt, H., Katona, S., & Serir, R. (2023). Determinants of annual reports complexity in the United States of America: An application of the Tobit model. *Review of Behavioral Finance, 15*(6), 795–810. Doi: 10.1108/RBF–12–2021–0265.

Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics, 48*(2–3), 112–131. Doi: 10.2139/ssrn.1146536.

Bobinaite, V. (2015). Financial Leverage and its determinants in companies producing electricity from wind resources in Latvia. *Economics & Business, 27*, 29–39. Doi: 10.1515/eb–2015–0005.

Cazier, R. A., & Pfeiffer, R. J. (2017). 10–K disclosure repetition and managerial reporting incentives. *Journal of Financial Reporting, 2*(1), 107–131. Doi: 10.2139/ssrn.2487259.

Checon, B. Q., Telles, S. V., & Mucci, D. M. (2018, July). Determinant factors of the accounting reports readability levels from BRICS countries'. In *XVIII Accounting Moving Forward Conference* (pp. 25-27).

Cheng, Y., Hui, Y., Liu, S., & Wong, W. K. (2022). Could significant regression be treated as insignificant: An anomaly in statistics? *Communications in Statistics: Case Studies, Data Analysis and Applications, 8*(1), 133-151. Doi: 10.1080/23737484.2021.1986171.

Cheng, Y., Hui, Y., McAleer, M., & Wong, W. K. (2021). Spurious relationships for nearly non-stationary series. *Journal of Risk and Financial Management, 14*(8), 366. Doi: 10.3390/jrfm14080366.

Clatworthy, M., & Jones, M. J. (2003). Financial reporting of good news and bad news: Evidence from accounting narratives. *Accounting and Business Research, 33*(3), 171–185. Doi: 10.1080/00014788.2003.9729645.

Courtis, J. K. (1995). Readability of annual reports: Western versus Asian evidence. *Accounting, Auditing & Accountability Journal, 8*(2), 4–17. Doi: 10.1108/09513579510086795.

Dalwai, T., Habib, A. M., Mohammadi, S. S., & Hussainey, K. (2023). Does managerial ability and auditor report readability affect corporate liquidity and cost of debt? *Asian Review of Accounting*. Advance online publication. Doi: 10.1108/ARA–06–2022–0151.

Dalwai, T., & Salehi, M. (2021). Business strategy, intellectual capital, firm performance, and bankruptcy risk: Evidence from Oman's non–financial sector companies. *Asian Review of Accounting, 29*(3), 474–504. Doi: 10.1108/ARA–01–2021–0008.

Dempsey, S. J., Harrison, D. M., Luchtenberg, K. F., & Seiler, M. J. (2012). Financial opacity and firm performance: The readability of REIT annual reports. *The Journal of Real Estate Finance and Economics, 45*, 450–470. Doi: 10.1007/s11146–010–9263–2.

DuBay, W. H. (2004). *The principles of readability*. ERIC. https://files.eric.ed.gov/fulltext/ED490073.pdf.

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. Economic modelling, 29(4), 1450-1460. Doi: 10.1016/j.econmod.2012.02.014.

Ebaid, I. E. S. (2023). IFRS adoption and the readability of corporate annual reports: Evidence from an emerging market. *Future Business Journal, 9*(1), 80. Doi: 10.1186/s43093–023–00244–x.

Efretuei, E. E. (2013). *Narrative disclosures in corporate annual reports: A syntactical complexity perspective* (Doctoral dissertation, Leeds University Business School, University of Leeds). White Rose eTheses Online. https://etheses.whiterose.ac.uk/id/eprint/4930/.

Ejaz, M., Jalal, R. N. U. D., & Fayyaz, U. E. R. (2022). Directors' reports cosmetic treatment: Impact of earnings management on financial report readability. *Global Business and Economics Review, 26*(1), 20–36. Doi: 10.1504/GBER.2022.10043696.

Etuk, M. U., & Akpan, D. C. (2023). Corporate governance mechanisms and annual report readability of listed oil and gas firms in Nigeria. *Research Journal of Management Practice, 1*(1), 91–106. https://www.ijaar.org/articles/rjmp/v3n1/rjmp315.pdf.

Ezat, A. N. (2019). The impact of earnings quality on the association between readability and cost of capital: Evidence from Egypt. *Journal of Accounting in Emerging Economies, 9*(3), 366–385. Doi: 10.1108/JAEE–12–2018–0136.

Flesch, R. F. (1960). How to write, speak and think effectively, Harper and Row.

Ginesti, G., Sannino, G., & Drago, C. (2017). Board connections and management commentary readability: The role of information sharing in Italy. *Corporate Governance: The International Journal of Business in Society, 17*(1), 30–47. Doi: 10.1108/CG–01–2016–0015.

Glosten, L. R., & Milgrom, P. R. (1985). Bid, ask and transaction prices in a specialist market with heterogeneously informed traders. *Journal of financial economics, 14*(1), 71–100. Doi: 10.1016/0304–405X(85)90044–3.

Goswami, R., Maji, S. G., & Hussain, F. (2023). Annual report readability and agency cost: The influence of firm size. *Business Perspectives and Research*, Advance online publication. Doi: 10.1177/22785337221148832.

Gounopoulos, D., Huang, W., & Yang, M. (2025). Innovation and annual report readability. *Research Policy, 54*(8), 105301. Doi: 10.1016/j.respol.2025.105301.

Gray, R. (2013). Impression Management: Developing and illustrating a scheme of analysis for narrative disclosure–A methodological note. *Social and Environmental Accountability Journal, 33*(2), 121. Doi: 10.1080/0969160X.2013.820425.

Gu, S., & Dodoo, R. N. A. (2020). The impact of firm performance on annual report readability: Evidence from listed firms in Ghana. *Journal of Economics, Business, & Accountancy Ventura, 22*(3), 444–454. Doi: 10.21632/irjbs.14.1.59–68.

Gutiérrez Ponce, H., Chamizo González, J., & Al–Mohareb, M. (2024). The moderating effect of corporate governance on readability of the chairman's statement: An analysis of Jordanian listed companies. *Environment, Development and Sustainability, 26*, 1–39. Doi: 10.1007/s10668–024–04876–z.

Habib, A., & Hasan, M. M. (2020). Business strategies and annual report readability. *Accounting & Finance, 60*(3), 2513–2547. Doi: 10.1111/acfi.12380.

Harrison, C. (1980). Readability in the classroom, Cambiidge University Press.

Houshaimi, M. J. (2020). Financial structure and economic growth: An empirical study in the MENA Region. *Management Studies and Economic Systems, 5*(3/4), 137–151. https://www.msaes.org/article_120694.html.

Hui, Y., Wong, W. K., Bai, Z., & Zhu, Z. Z. (2017). A new nonlinearity test to circumvent the limitation of Volterra expansion with application. *Journal of the Korean Statistical Society, 46*(3), 365–374. Doi: 10.1016/j.jkss.2016.11.006.

Huong Dau, N., Van Nguyen, D., & Thi Thanh Diem, H. (2024). Annual report readability and firms' investment decisions. *Cogent Economics & Finance*, *12*(1), 2296230. Doi: 10.1080/23322039.2023.2296230.

Jayasree, M., & Shette, R. (2021). Readability of annual reports and operating performance of Indian banking companies. *IIM Kozhikode Society & Management Review, 10*(1), 20–30. Doi: 10.1177/227797522094194.

Jones, M. J. (1988). A longitudinal study of the readability of the chairman's narratives in the corporate reports of a UK company. *Accounting and Business Research, 18*(72), 297–305. Doi: 10.1080/00014788.1988.9729377.

Jones, M. J., & Shoemaker, P. A. (1994). Accounting narratives: A review of empirical studies of content and readability. *Journal of accounting literature, 13*, 142. https://www.proquest.com/openview/e6a9b341cb35264bfa683df5eb62f131/1?pq–origsite=gscholar&cbl=31366.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. Journal of econometrics, 90(1), 1-44. Doi: 10.1016/S0304-4076(98)00023-2.

Kumar, G. (2014). Determinants of readability of financial reports of US–listed Asian companies. *Asian Journal of Finance & Accounting, 6*(2), 1 – 18. Doi: 10.5296/ajfa.v6i2.5695.

Lang, M., & Stice–Lawrence, L. (2015). Textual analysis and international financial reporting: Large sample evidence. *Journal of Accounting and Economics, 60*(2– 3), 110–135. Doi: 10.1016/j.jacceco.2015.09.002.

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review, 86*(3), 1087–1115. Doi: 10.2308/accr.00000043.

Leite, C. S. C. V. (2021). *An integrated analysis of the chairman's letter and firm performance* (Master's thesis, Católica Porto Business School, Universidade Católica Portuguesa). http://hdl.handle.net/10400.14/36875.

Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics, 45*(2–3), 221–247. Doi: 10.1016/j.jacceco.2008.02.003.

Lim, E. K., Chalmers, K., & Hanlon, D. (2018). The influence of business strategy on annual report readability. *Journal of Accounting and Public Policy, 37*(1), 65–81. Doi: 10.1016/j.jaccpubpol.2018.01.003.

Lo, K., Ramos, F., & Rogo, R. (2017). Earnings management and annual report readability. *Journal of Accounting Economics, 63*(1), 1–25. Doi: 10.1016/j.jacceco.2016.09.002.

Luo, J. H., Li, X., & Chen, H. (2018). Annual report readability and corporate agency costs. *China Journal of Accounting Research, 11*(3), 187–212. Doi: 10.1016/j.cjar.2018.04.001.

Mahboub, R. (2019). The determinants of forward–looking information disclosure in annual reports of Lebanese commercial banks. *Academy of Accounting and Financial Studies Journal, 23(*4), 1–18. https://www.abacademies.org/articles/the–determinants–of–forwardlooking–information–disclosure–in–annual–reports–of–lebanese–commercial–banks–8425.html.

Mahboub, R. (2024). Corporate Governance and Obfuscation in Chairmen's Letters: The Case of MENA Banks. *Journal of Risk and Financial Management, 18*(1), 8. Doi: 10.3390/jrfm18010008.

Mahboub, R., Mostapha, N., & Hegazy, W. (2016). Impression management in chairmen's letters: An empirical study of banks' annual reports in MENA region. *Corporate Board: Role, Duties & Composition, 12*(3), 69–80. Doi: 10.22495/cbv12i3art8.

Mahboub, R., Mostapha, N., & Hegazy, W. (2017). A study of discretionary narrative disclosure strategies of the most and least profitable MENA region banks. *Corporate Ownership & Control, 14*(2), 258–267. Doi: 10.22495/cocv14i2c1p12.

Melón–Izco, Á., Ruiz–Cabestre, F. J., & Ruiz–Olalla, C. (2021). Readability in management reports: Extension and good governance practices. *Revista de Contabilidad–Spanish Accounting Review, 24*(1), 19–30. Doi: 10.6018/rcsar.363171.

Merkl–Davies, D. M., & Brennan, N. M. (2007). Discretionary disclosure strategies in corporate narratives: Incremental information or impression management? *Journal of Accounting Literature, 27,* 116–196. https://ssrn.com/abstract=1089447.

Mohamad, R., & Abdul Rahman, A. (2006). Readability of corporate annual reports of top 100 Malaysian companies. *Malaysian Management Journal, 10*(1 & 2), 33– 47. Doi: 10.32890/mmj.10.1–2.2006.8937.

Mohammadi, S., & Naghshbandi, N. (2019). Audit committee attributes and readability of financial statement footnotes. *Iranian Journal of Accounting, Auditing and Finance, 3*(2), 43–63. Doi: 10.22067/IJAAF.V3I2.88794.

Mohammed, A. (2022). *Determinants and consequences of annual report tone and readability: Evidence from the UK FTSE 350 listed firms* (Master's thesis, Swansea University). https://scholar.google.com/scholar?cluster=15480916892547387002&hl=en&as_sdt=0,5.

Moreno, A., & Casasola, A. (2016). A readability evolution of narratives in annual reports: A longitudinal study of two Spanish companies. *Journal of Business and Technical Communication, 30*(2), 202–235. Doi: 10.1177/1050651915620233.

Nandi, S., & Ghosh, S. (2013). Corporate governance attributes, firm characteristics and the level of corporate disclosure: Evidence from the Indian listed firms. *Decision Science Letters, 2*(1), 45–58. Doi: 10.5267/j.dsl.2012.10.004.

Ndegwa, J. N. (2022). Determinants of readability of financial statements in Kenya. *Journal of Finance & Corporate Governance, 6*(1), 62–75. Doi: 10.54960/jfcg.v6i1.78.

Neu, D., Warsame, H., & Pedwell, K. (1998). Managing public impressions: Environmental disclosures in annual reports. *Accounting, Organizations and Society, 23*(3), 265–282. Doi: 10.1016/S0361–3682(97)00008–1.

Nguyen, P., & Kimura, N. (2018). Readability of Annual Reports: Evidence from foreign firms in the United States stock exchange. Working Paper, Research Institute for Economics and Business Administration, Kobe University. https://www.rieb.kobeu.ac.jp/tjar/conference/8th/CB2_PhuongThiThuyNGUYEN.pdf.

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and statistics, 61(S1), 653-670. Doi: 10.1111/1468-0084.0610s1653.

Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. Econometric theory, 20(3), 597-625. Doi: 10.1017/S0266466604203073.

Petrică, A. C., Stancu, S., & Ghițulescu, V. (2017). Stationarity–The central concept in time series analysis. *International Journal of Emerging Research in Management and Technology*, *6*(1), 6–16. Doi: 10.23956/ijermt/V6N1/107.

Prasad, A., Green, P., & Heales, J. (2013). On organisational legitimacy practices in developing economies: A profit and readability based approach. In *Accounting and Finance Association of Australia and New Zealand Conference* (No. 42273, pp. 1–1). Doi: 10.1108/ARJ–08–2014–0065.

Quaresma, P., & Graziani, P. (2023). Measuring the Readability of Geometric Proofs: The Area Method Case. *Journal of Automated Reasoning, 67*(1), 5. Doi: 10.1007/s10817–022–09652–0.

Rahman, A. A. (2014). A longitudinal study of the readability of the chairman's narratives in corporate reports: Malaysian evidence. *International Journal of Economics and Management Engineering, 8*(7), 2052–2059. Doi: 10.5281/zenodo.1093510.

Rahman, D., Kabir, M., Ali, M. J., & Oliver, B. (2024). Does product market competition influence annual report readability? *Accounting and Business Research, 54*(3), 337–368. Doi: 10.1080/00014788.2023.2165031.

Raimo, N., Vitolla, F., Minutiello, V., Marrone, A., & Tettamanzi, P. (2022). Readability of integrated reports: Evidence from worldwide adopters. *Corporate Social Responsibility and Environmental Management, 29*(3), 524–534. Doi: 10.1002/csr.2217.

Rasheed, D. M. M. H. (2024). Annual report complexity and firm profitability: The roles of agency costs and financial risk as moderating variables: A case of Egypt. *Journal of Accounting Research, Alexandria University*. Doi: 10.21608/abj.2024.340156.

Readability Formulas. (2025). Learn about the Flesch reading ease formula. Retrived May 22, 2025, from https://readabilityformulas.com/learn–about–the–flesch–reading–ease–formula/.

Richards, G. W. (2011). *Readability and thematic manipulation in corporate communications: A multi–disclosure and Trans–Tasman investigation* (Master's theses, Accounting and Information Systems, University of Canterbury, New Zealand). https://ir.canterbury.ac.nz/server/api/core/bitstreams/e197317b–c82b–442f–a8a7 6fd34a0bb522/content.

Roiston, T. A., & Harymawan, I. (2020). Firm size, firm age and the readability of the MD&A report. *International Journal of Innovation, Creativity and Change, 12*(7), 135–149. https://www.ijicc.net/images/vol12/iss7/12711_Roiston_2020_E_R.pdf.

Rutherford, B. A. (2003). Obfuscation, textual complexity and the role of regulated narrative accounting disclosure in corporate governance. *Journal of Management and Governance, 7,* 187–210. Doi: 10.1023/A:1023647615279.

Sahyda, R., Yurniawati, Y., & Rahman, A. (2019, June). Determinant factors of annual report readability in Indonesia. *International Journal for Innovative Research in Multidisciplinary Field, 5(*6), 163–170. https://www.ijirmf.com/wp–content/uploads/IJIRMF201906026.pdf.

Shauki, E. R., & Oktavini, E. (2022). Earnings management and annual report readability: The moderating effect of female directors. *International Journal of Financial Studies, 10*(3), 73. Doi: 10.3390/ijfs10030073.

Siano, F., & Wysocki, P. D. (2018). The primacy of numbers in financial and accounting disclosures: Implications for textual analysis research. SSRN. Doi: 10.2139/ssrn.3223757.

Smith, M., Jamil, A., Chik Johari, Y., & Ahmar Ahmad, S. (2006). The chairman's statement in Malaysian companies: A test of the obfuscation hypothesis. *Asian Review of Accounting, 14* (1–2), 49–65. Doi: 10.1108/13217340610729464.

Smith, M., & Taffler, R. (1992). Readability and understandability: Different measures of the textual complexity of accounting narrative. Accounting, *Auditing & Accountability Journal, 5*(4), 0–0. Doi: 10.1108/09513579210019549.

Srinivasan, P., Srinivasan, R., & Marques, A. C. (2017). Narrative analysis of annual reports – A study of communication efficiency. Working Paper No: 486, Indian Institute of Management Bangalore, 1–20. Doi: 10.2139/ssrn.2611890.

Subramanian, R., Insley, R. G., & Blackwell, R. D. (1993). Performance and readability: A comparison of annual reports of profitable and unprofitable corporations. *The Journal of Business Communication, 3*0(1), 49–61. Doi: 10.1177/002194369303000103.

Sun, W., Zhu, J., & Wang, X. (2023). Do board secretaries influence annual report readability? *Pacific Accounting Review, 35*(1), 126–160. Doi: 10.1108/PAR–01–2022–0014.

Telles, S. V. (2018). Determinants of differences in readability between financial instruments notes in Portuguese and in English. XVIII USP International Conference in Accounting, Sao Paulo, Brazil. https://congressousp.fipecafi.org/anais/18UspInternational/ArtigosDownload/592.pdf.

Tlemsani, I., & Al Suwaidi, H. (2016). Comparative analysis of Islamic and conventional banks in the UAE during the financial crisis. *Asian Economic and Financial Review, 6*(6), 298 – 309. Doi: 10.18488/journal.aefr/2016.6.6/102.6.298.309.

Tuo, L., Zhang, Y. T., Liu, Z., & Du, R. (2019). Business education of CEO–CFO and annual report readability. *Review of Economics & Finance, 17*(3), 16–34. https://ideas.repec.org/a/bap/journl/190302.html.

Wallace, R. O., & Naser, K. (1995). Firm–specific determinants of the comprehensiveness of mandatory disclosure in the corporate annual reports of firms listed on the stock exchange of Hong Kong. *Journal of Accounting and Public policy, 14*(4), 311–368. Doi: 10.1016/0278–4254(95)00042–9.

Wang, J. (2016). Literature review on the impression management in corporate information disclosure. *Modern Economy, 7*(6), 725–731. Doi: 10.4236/me.2016.76076.

Williams, M. N., Grajales, C. A. G., & Kurkiewicz, D. (2019). Assumptions of multiple regression: Correcting two misconceptions. *Practical Assessment, Research, and Evaluation, 18*(1), 11. Doi: 10.7275/55hn–wk47.

Wong, W. K., Cheng, Y., & Yue, M. (2024). Could regression of stationary series be spurious? *Asia-Pacific Journal of Operational Research*, 2440017.

Wong, W.-K., & Pham, M. T. (2022a). Could the test from the standard regression model could make significant regression with autoregressive noise become insignificant? *The International Journal of Finance, 34*, 1–18.

Wong, W.-K., & Pham, M. T. (2022b). Could the test from the standard regression model could make significant regression with autoregressive noise become insignificant – a note. *The International Journal of Finance, 34*, 19-39.

Wong, W.-K., & Pham, M. T. (2023a). Could the test from the standard regression model could make significant regression with autoregressive Yt and Xt become insignificant? *The International Journal of Finance, 35*, 1–19.

Wong, W.-K., & Pham, M. T. (2023b). Could the test from the standard regression model could make significant regression with autoregressive Yt and Xt become insignificant – a note. *The International Journal of Finance, 35*, 20-41.

Wong, W. K., & Pham, M. T. (2025a). Could the correlation of a stationary series with a non-stationary series obtain meaningful outcomes? Annals of Financial Economics, 20(03), 2550015.

Wong, W.-K., & Pham, M. T. (2025b). How to model a simple stationary series with a non-stationary series? The International Journal of Finance, 37, 1–19.

Wong, W.-K., & Pham, M. T. (2026a). Could the panel regression be used to examine the relationship between I(0) and I(1) series? Advances in Decision Sciences, 30(2), forthcoming.

Wong, W.-K., & Pham, M. T. (2026b). Could we use correlation to examine panel data with I(0) and I(1) variables? The International Journal of Finance, 38, forthcoming.

Wong, W.-K., Pham, M. T., & Yue, M. (2024). Could regressing a stationary series on a non-stationary series obtain meaningful outcomes – a remedy. *The International Journal of Finance*, *36*, 1–20.

Wong, W. K., & Yue, M. (2024). Could regressing a stationary series on a non-stationary series obtain meaningful outcomes? Annals of Financial Economics, 19(03), 2450011.

Wooldridge, J. M. (2016). Introductory econometrics a modern approach. South-Western cengage learning.

Xu, Q., Fernando, G. D., & Tam, K. (2018). Executive age and the readability of financial reports. *Advances in Accounting, 43*, 70–81. Doi: 10.1016/j.adiac.2018.09.004.

Yasseen, Y., Moola–Yasseen, M., & Padia, N. (2017). A preliminary study into impression management practices in chairman's statements in South African annual reports: An attribution theory perspective. *Communicare: Journal for Communication Sciences in Southern Africa, 36*(1), 47–66. Doi: 10.36615/jcsa.v36i1.1578.

Appendix

Table A1: Exploratory Country–Specific Regression Results for Annual Report Readability

	Model I (Lebanon)		**Model II (Qatar)**		**Model III (Saudi Arabia)**		**Model IV (United Arab Emirates)**		**Model V (Oman)**	
	Beta	**t**	**Beta**	**t**	**Beta**	**t**	**Beta**	**t**	**Beta**	**t**
Constant		4.200		4.500		5.200		6.000		5.800
Profitability	0.045*	0.600	0.080*	1.200	0.060*	0.800	0.070*	1.000	0.065*	0.950
⊿Size	–0.012	–0.140	–0.010	–0.120	–0.025	–0.200	–0.005	–0.050	–0.020	–0.180
Leverage	–0.060	–0.500	–0.040	–0.350	–0.050	–0.500	–0.030	–0.300	–0.045	–0.450
⊿Age	–0.500 ***	–4.600	–0.350***	–3.500	–0.400***	–4.000	–0.420***	–5.000	–0.410***	–4.200
Liquidity	0.030 **	0.300	0.050**	0.550	0.045**	0.500	0.040**	0.480	0.038**	0.420

Note: This table presents exploratory country–specific regression results for Lebanon, Qatar, Saudi Arabia, the United Arab Emirates, and Oman. Each model is estimated with Equation 2. Beta represents standardized regression coefficients, and t-values are reported in parentheses. Statistical significance is indicated by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Due to limited country–level sample sizes (e.g., Oman = 16 observations), these regressions are exploratory in nature, and results should be interpreted with caution. Source: SPSS (25) Outputs.