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RESEARCH

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IFRS adoption and the readability of corporate annual reports: evidence from an emerging market

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Abstract

This study aims to investigate the impact of adopting International Financial Reporting Standards (IFRS) on the readability of corporate annual reports of Saudi companies. Data have been collected for a sample of 67 companies listed on the Saudi Stock Exchange for the period 2014–2019. Statistical methods such as the independent sample *t* test, the Wilcoxon matched-pair test, and the multiple regression analysis have been used to examine the effect of adopting IFRS on the readability of the corporate annual report. The results of the study reveal that the adoption of IFRS has led to a decrease in the readability of the corporate annual report. The results also indicate that there is a significant impact of the company's size and profitability on the readability of the corporate annual report, while the leverage and industry in which the company operates do not have a significant impact on the readability of the corporate annual report. Since the annual reports of Saudi companies are published in Arabic, the study is not able to use the most popular readability indexes in the literature such as the Fog Index, Gunning Fox Index, Flesch–Kincaid Grade Index, and Flesch Reading Ease Index. Instead, the study uses three readability measures appropriate to the readability of annual reports prepared in Arabic, namely report length, report size, and LIX formula. The study contributes to the global debate about the economic consequences of adopting International Financial Reporting Standards (IFRS) by examining the impact of adopting IFRS on the readability of corporate annual reports, considering that this report is the main and official communication tool between the company and its stakeholders. This study is the first study to examine the impact of adopting IFRS on the readability of corporate annual reports in Saudi Arabia as one of the emerging markets.

Keywords IFRS, Corporate annual report, Readability, Saudi Arabia

Introduction

The annual report is the primary mean by which companies formally communicate with their stakeholders and the primary source of information for stakeholders to better understand the company its value system [75]. The literature has shown the importance of the information provided by this report in mitigating information asymmetry in the capital market (e.g., [15, 19, 24, 38, 71, 72]). To succeed in performing its role effectively, this report must be readable. Otherwise, at least some readers will find it difficult to extract the information they rely on in making their decisions [25, 29, 59, 61, 74]. Readability refers to the reader's success in reading the texts written in the corporate annual report, which is reflected in the reader's success in understanding this report and assimilating information relevant to the company's evaluation through financial disclosure. The most widely embraced accounting standards in the world, namely the International Financial Reporting Standards (IFRS) developed by the International Accounting Standards Board (IASB)

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and the US Generally Accepted Accounting Principles (GAAP) developed by the FASB, agree that the information presented in corporate reports is not useful if the report users cannot understand them [25, 52, 55, 59, 61]. Accordingly, readability is a key factor in the company's success in sending accounting messages to its stakeholders [74]. Although readability is a basic determinant of understandability, readability and understandability are two different concepts. Readability focuses on analyzing the complexity of text presentation. That is, it centers around the text, and measures the difficulty of the text in the passage. On the other hand, understandability is the users' ability to discern the correct meaning of the passage. Understandability focuses on the interaction of the text reader with the text itself and thus considers the characteristics of the readers, such as context, background, prior knowledge, education, interest, and general reading ability [49, 50].

The literature has provided empirical evidence on the importance of corporate annual report readability. Lower readability is often associated with complex, lengthy, or verbose expressions, making it hard for readers to extract information from the corporate annual report [68, 75, 76]. Analyzing complex report requires significant cost and time to explore useful information, so investors are unlikely to invest when faced with such reports and this would reduce the volume of transactions [18, 27, 32, 42, 54]. Companies with less readable annual reports tend to have higher analyst coverage, greater analyst dispersion, lower accuracy, and greater overall uncertainty in analyst earnings forecasts [55]. Companies with less readable reports may have higher stock return volatility and greater absolute profit surprises [12, 30, 42, 59]. Companies that disclose more complex annual reports (that is, longer and difficult to read) are more likely to suffer from severe information asymmetry problems that lead to less favorable ratings, greater bond rating agency disagreement, and higher cost of capital [12, 17, 31, 60, 70]. Companies with less readable annual reports have longer audit report lag, incur higher audit fees, and are more likely to receive a first-time modified going-concern opinion [1, 16, 79, 80]. Hesarzadeh and Bazrafshan [41] reveal that corporate reporting readability reduces the regulatory review risk. Xu et al. [79, 80] indicate that suppliers extend more trade credit to companies with more readable annual reports.

IFRS are developed by the IASB and seek to reduce complexity in accounting standards [48] and provide comprehensive accounting guidelines to enhance concise corporate disclosures [22]. However, IFRS are principle-based disclosure regime where companies have discretion in disclosing financial and non-financial information but must explain why such accounting choices have been made [48]. With the adoption of IFRS, the content included in corporate reports is now much broader, leading to heightened concerns of complexity and severe information overload [57]. Therefore, both the readability and conciseness of corporate reports are relevant under the IFRS reporting framework. In other words, it is necessary to explore whether increasing disclosure complexity and disclosure overload are associated with corporate reports prepared in compliance with IFRS. In prior literature, there is no consensus on the impact of the adoption of IFRS on corporate report readability (e.g., [22, 28, 43, 63, 69, 75]). In addition, to date no study has investigated the effects of IFRS on the readability of corporate reports in the Saudi context. In order to fill these gaps in the literature, the aim of this study is to investigate whether IFRS adoption impacts the readability of corporate reports by Saudi listed companies. In fact, this study is important for three reasons. First, in developing countries such as Saudi Arabia, the corporate annual report is the main and almost the only source of information about the company. Developing countries are characterized by weaker market structure, weaker regulation, weaker financial media, and weaker financial analysis profession compared to their counterparts from developed countries. This results in a lack of information sources other than corporate annual reports in these countries. Second, Western mature economies like the USA are particularly concerned about the readability of corporate reports. For example, the US Securities Act of 1933 prescribed a policy for "Plain English" writing to ensure that report users can understand disclosures released by firms [56]. However, the readability of corporate reporting in emerging market economies like Saudi Arabia has not attracted much attention. In effect, compared with developed Western economies, the management of a company in an emerging market economy is more likely to reduce the readability of corporate reporting to manipulate reporting users' understanding of the actual financial situation of the firm [58, 75]. Third, this study contributes to another controversial issue, which is the effect of adopting IFRS on the readability of the corporate annual reports. Saudi Arabia has adopted IFRS for reporting periods beginning on or after January 1, 2017. Increasing accounting information quality was one of the main reasons that were relied upon to promote the adoption of IFRS in Saudi Arabia. To date, it remains uncertain whether the adoption of IFRS has increased the quality of accounting information in Saudi Arabia. One of the qualitative characteristics of accounting information is understandability. An important characteristic of the information contained in the corporate annual reports is that it is understandable by users. Understandability depends on readability, more readable reports are more understandable by users. Therefore, examining the impact of adopting IFRS on readability is a test of the success of adopting IFRS in increasing the quality of accounting information.

Accordingly, the main question of this study is how has the adoption of IFRS affected the readability of corporate annual reports in Saudi Arabia? To answer this question, the remainder of this study is organized as follows: The second section provides a brief background on the environment of the corporate annual reports in Saudi Arabia. The third section presents the literature review and hypothesis development. The fourth section shows the study methodology. The fifth section presents the analyses and results, while the sixth section presents the conclusion and recommendations.

Corporate annual reporting environment in Saudi Arabia

The corporate annual reporting environment in Saudi Arabia is governed by a set of laws and legislations, which are:

Company law no. M/6/1965

The Saudi Company Law was issued in 1965 by the Royal Decree No. M/6 dated May 2, 1965. Article 89 of this law states that the board of directors, for each fiscal year, should prepare the balance sheet of the company, the profit and loss account, a report on the activities of the company, and the proposed way for the distribution of the net profits at least 60 days before the annual meeting of the Ordinary General Assembly. The president of the board of directors should sign the referred documents, and the copies thereof should be deposited in the main center of the company at the disposal of the shareholders 25 days at least before the deadline for the General Assembly. The president of the board of directors should publish, in a newspaper distributed in the main center of the company, the balance sheet of the company, the profit and loss account and a compendium of the report of the board of directors and the full text of the auditor's report 25 days at least before the date of the General Assembly.

The CPA law no. M/12/1991

The Certified Public Accountants Law was issued by the Royal Decree No. M/12 dated November 19, 1991. Article 19 of this law stipulates the establishment of a body affiliated with the Ministry of Commerce called the Saudi Organization for Certified Public Accountants (SOCPA). SOCPA's responsibilities include the development and approval of accounting and auditing standards and undertaking all matters that lead to the development of the accounting profession and the promotion of its status. The SOCPA started its work in 1992 and until 2015 it issued 22 Saudi accounting standards that companies abide by when preparing financial reports. In 2012, SOCPA adopted a project called "SOCPA Project for Transition to International Accounting and Auditing Standards." SOCPA started the project in 2012 and completed it in 2016. The stated objective of the SOCPA for the project is to move to IFRS standards after ensuring their suitability for the Saudi environment through the SOCPA's independent standard-setting process.

Mandatory adoption of IFRS

In 2016, SOCPA completed a review of all IFRS (including interpretations) on the IFRS 2017 Red Book. As a result of the review, SOCPA adopted all of the IFRS without amending any requirements in those standards. SOCPA did add disclosure requirements to several standards, mainly to reflect Sharia (religious tax/obligation) or local law. SOCPA has also endorsed the recent IFRS including IFRS 9, IFRS 15, and IFRS 16, encouraging early adoption. Starting on 1/1/2017, SOCPA requires all listed companies to implement IFRS that are endorsed by SOCPA. Starting in 2018, SOCPA requires all other publicly accountable entities to use IFRS that are endorsed by SOCPA. Also, the Saudi Arabian Monetary Authority (SAMA, which is the Saudi Arabian central bank) requires all banks and insurance companies to implement IFRS as endorsed by SOCPA starting on 1/1/2017 whether or not they are listed.

Stock exchange law M/30/2003

The current Capital Market Law is promulgated and pursuant to Royal Decree No. (M/30) dated July 31, 2003, which formally brought the Capital Market Authority (CMA) into existence. CMA is a government organization applying full financial, legal, and administrative independence, and has direct links with the Prime Minister. CMA is responsible for regulating and developing the financial market in Saudi Arabia, and it has the right to set and impose regulations and rules aimed at protecting investors and ensuring fairness and efficiency in the capital market. According to the regulations of CMA, all listed companies must submit the full annual reports prepared in accordance with International Financial Reporting Standards (IFRS) to the Capital Market Authority no later than 90 days from the date of the end of the financial year, provided that these reports are uploaded to the authority's website within six business days from the date of receipt from the companies.

Literature review and hypothesis development

Previous studies have examined a wide range of factors that may affect the readability of the corporate annual report. Some studies show that companies that indulge in earnings management tend to produce less readable annual reports to mask their earnings management practices [2, 10, 56]. Another group of studies has documented a relationship between readability and CEO/CFO's characteristics such as gender, age, business knowledge, cognitive preferences, power, professional ethics, myopia, narcissism, and overconfidence [7, 33, 37, 65, 71, 72, 76]. On the other hand, some studies have highlighted the significant impact of corporate governance attributes (i.e., the board size, board meetings, board independence, ownership structure, board expertise, gender diversity, etc.) on the readability of corporate annual reports [21, 36, 53, 67, 71, 72]. Other studies have examined the impact of the company's financial performance on readability and show that managers of companies that perform well tend to prepare more readable annual reports [11, 13, 14, 30, 34, 37]. Other studies have linked readability with the nature of the strategy adopted by the company and show that companies pursuing an innovation-oriented prospector strategy, companies with more complex strategy companies that have strategic emphasis on value creation have less readable annual reports relative to companies pursuing an efficiency-oriented defender strategy, companies with less complex strategy and companies that have strategic emphasis on value appropriation [35, 40, 57, 61]. Some studies have linked the readability with a country's domestic culture and suggest that those companies from countries with stronger transparency tendencies are more likely to publish more readable corporate reports [23, 52]. Finally, some studies have examined the relationship between the readability and the type of audit opinion a company receives. For example, Kawada and Wang [51] indicate a negative and significant association between the issuance of a going-concern report to the company and the company's readability index in the subsequent year.

This study aims to contribute to this research stream by examining the impact of adopting IFRS on the readability of the corporate annual report, specifically in Saudi Arabia. Saudi Arabia has adopted IFRS as of January 1, 2017. IFRS is a set of accounting standards that have been developed for a global market as an important means of enhancing the comparability of financial statements across countries. IFRS is viewed as a single set of high-quality, understandable, enforceable, and globally accepted financial reporting standards based on clearly defined principles [47]. While some previous studies do not find evidence that IFRS adoption affects the readability of corporate report [62], most studies confirmed that IFRS adoption has a negative effect on the readability of corporate report for two reasons. The first reason is that IFRS requires more disclosure, which leads to an increase in the length of the annual report, and thus makes it more difficult to read. Several studies argue that the disclosure requirements under IFRS are more extensive than most domestic standards (e.g., [22, 23, 28]). Morunga and Bradbury [64] show that the introduction of IFRS in New Zealand has increased the length of annual reports for 92% of their sample and the average increase was 15%. The problem with excessive report length is that it can exceed the decision-makers' capacity to process information. Also, Richards and Staden [69] indicate that the adoption of IFRS in New Zealand has led to an increase in the length of annual reports disclosures and an increase in the use of tables, which increased the complexity of these reports and thus led to a decrease in its readability. Cheung and Lau [22] argue that the financial reports of Australian companies have become lengthier after the application of IFRS. They explain that the application of IFRS has an impact on many accounting policies and standards, for example, business combinations and goodwill, financial instruments, share-based payments, intangible assets, leases, inventories, etc. These changes increased disclosures and then an increase in the length of notes on the financial statements. Hidayatullah and Setyaningrum [43] provide evidence that IFRS adoption has a significant and negative relationship with disclosure readability in Indonesia because the adoption of IFRS requires more complex and/or more competent users of financial statements to understand the disclosures. Sun et al. [75] show that both the levels of readability and conciseness of corporate reports by Chinese companies are not satisfactory and also exhibit a downward trend after adopting IFRS in China. Hoogendoorn [44] expressed concern that IFRS is too complex, even for auditors and other professionals, and that financial statements will be difficult to read and understand for most users. Miah et al. [63] found that IFRS has a positive effect on analyst forecast errors, forecast dispersion, and forecast revision.

The second reason relates to the problem of IFRS translation. Although originally promulgated in English, IFRS are often prepared in the local language of each country. It is highlighted in the linguistic and communication literature that critical meanings are often lost in translation [66]. Huerta et al. [45] conclude that the use of IFRS in languages other than English creates the potential for translation differences that may introduce variations in accounting outcomes when different languages are used. Hellmann and Patel [39] argue that accountants and users in a particular country may make inferences about the meaning of IFRS that is not consistent with the meaning intended by the IASB simply because the accounting standards are promulgated in English and then translated globally their local language. Jang and Rho [48] suggest that the translation might not match the meanings intended by the IFRS. Therefore, it is important to study whether the understandability of annual reports has been improved under the IFRS in non-English speaking environments such as Saudi Arabia.

In general, previous studies conclude that the adoption of IFRS may have a negative impact on the readability of corporate annual reports due to the increase in the number of disclosures in the report or the difficulties of translating IFRS into the local language. Accordingly, the study hypothesis can be formulated as follows:

H01 The adoption of IFRS has a negative and significant impact on corporate annual report readability in Saudi Arabia.

Research method

Sample and data

To examine the impact of the mandatory adoption of IFRS on corporate annual report readability in Saudi Arabia, the study compares the readability measures calculated from the corporate annual reports in the post-adoption period (according to IFRS) with the same measures calculated from the corporate annual reports in the pre-adoption period (according to Saudi accounting standards). As mentioned previously, the mandatory adoption of the IFRS in Saudi Arabia began with the fiscal year beginning on January 1, 2017. When determining the post-mandatory adoption period, the corporate annual reports for the fiscal year 2020 were excluded because this year witnessed exceptional circumstances as a result of the complete closure of the Saudi economy as part of the precautionary procedures for the Covid-19 pandemic, which had a significant impact on all corporate annual reports of Saudi companies. Consequently, the study defined the post-mandatory adoption period to include three years, namely 2017–2019. To achieve consistency between the pre- and post-adoption periods, the study defined the pre-mandatory adoption period to also include three years, namely 2014–2016. Accordingly, the study period includes six years: three years before the mandatory adoption of IFRS (2014–2016) and three years after the mandatory adoption of IFRS (2017–2019).

The study population includes all companies listed on the Saudi Stock Exchange (Tadawul). By the end of 2019, the number of companies listed in the Saudi market reached 173 companies distributed over 20 sectors. In the first step for selecting the sample, the 45 financial companies (i.e., banks and insurance companies) were excluded, as the methods of preparing, measuring, and disclosing some items in the annual reports of these companies differed to some extent from non-financial companies due to their subjection to special legislation in addition to IFRS. In the second step, 61 other companies were excluded from the study population for various reasons, such as some companies were listed in the stock market after the year 2014, and then their published annual reports on the Saudi Stock Exchange website do not cover the entire study period. Also, some companies were merged into other companies during the study period, and then no longer had their own published annual reports. In addition, some companies whose registration in the financial market was canceled during the study period. After these two steps, the remaining 67 non-financial companies represent the sample for this study. Table 1 shows the distribution of the study sample among sectors.

Variables and measurements

Readability (dependent variable)

Investigation of the readability of English texts dates back to the 1920s. Over time, the readability literature has seen the emergence of several measures of readability such as the Flesch Reading Ease formula, the Flesch–Kincaid Grade Level formula, the Gunning Fox Index Readability (FOG) formula, the Automated Readability Index, and the SMOG formula [20]. These measures were statistically estimated from texts and were based on easy-to-calculate text descriptors, such as sentence length in words and the average number of syllables per word. Some studies have attempted to develop measures of readability for languages other than English, such as the LIX Index for the Swedish and Danish languages, the Fernandez-Huerta Index for the Spanish language, and the Kandal and Moles Index for the French language [77]. The annual reports of Saudi companies are prepared in the Arabic language. Despite the urgent need for a measure of readability for the Arabic language, the literature on the readability of the Arabic language is still in its early stages.

Table 1 Distribution of the sample across sectors

Sector	Number of companies	Percentage (%)
Basic industries	25	37.3
Telecommunications	4	5.9
Food production	12	17.9
Transportation	5	7.5
Real estate development	6	8.9
Capital goods	7	10.5
Retail trade	3	4.5
Healthcare	2	3
Pharmaceutical	1	1.5
Applications and Technology services	1	1.5
Media and entertainment	1	1.5
Total	67	100

Only a few studies have attempted to develop readability measures for the Arabic language based on measures that have been developed for the English language [3–5, 8, 9]. These measures of Arabic readability did not achieve the hoped-for success for several reasons (for more details see: [20]). First, the Arabic vocabulary is very rich and has a high frequency of synonyms, so the same meaning can be expressed in a large number of words that differ in terms of difficulty in reading. The same accounting term in English can be expressed in four or five terms in Arabic. Although these Arabic terms all have the same meaning, they differ in the number of letters and syllables, and hence the degree of difficulty. Second, counting syllables in Arabic is not a straightforward process because it is not associated with specific vowels as in English. To correctly calculate the readability in Arabic, we need to count the number of syllables. An Arabic word can have more than three syllables and is still considered a non-complex word [3]. Third, Arabic is highly inflectional and derivational; therefore, word length and the number of sentences cannot be used as indicators of text readability. Arabic readability studies have removed diacritics to simplify language processing, but this leads to difficulty in understanding word meaning in the absence of diacritics even for Arabic speakers [3, 9]. Fourth, Arabic readability measures that have been developed by previous studies were specifically designed to measure the readability of educational curricula in the first grades. This may create difficulty when using these measures to measure the readability of a corporate annual report [9, 20].

In light of these limits of measures that have been proposed in studies on the readability of the Arabic language, it is difficult to rely on them in measuring the readability of the annual reports of companies in a meaningful way. For this study, three simplified measures were used that do not depend on the syllable counting method. Syllable counting may prove inaccurate in non-English languages as is the case in Saudi Arabia. These three measures are the length of the annual report, the size of the annual report, and the LIX formula. The first two measures which are the length of the annual report and the size of the annual report have been used in several previous studies. (e.g., [30, 46, 56, 59, 60, 78]). Consistent with these studies, the length of the annual report was measured through the number of pages of the report while the size of the report was measured through the number of megabytes of the report. Longer and larger annual reports are expected to be less readable. Both of these measures of readability are based on the idea of overwriting. Documents are written in a way that is too detailed and too long for readers to process easily. The third measure is the LIX formula which is one of the formulas that has been widely applied in countries where English is not the first language. LIX was developed in Sweden. It was created by Carl–Hugo Björnsson in 1968. The LIX formula is practical because it can be applied to documents written in any non-English language [31]. LIX is not only simple in calculating mathematical formulas, but differs from English readability measures in that it bypasses the problem of counting single-syllable words, multi-syllable words, or total syllables by only including words that exceed a certain length. Being a scale that ignores the grammar of slicing suggests that it is likely to be useful across different languages, including Arabic Languages. Hence, it can be used as a measure of the readability of annual reports not written in English as it is more suitable than any other formula for measuring Arabic text [26, 31, 58]. LIX uses two main components to assess the level of readability: word length and sentence length. According to the LIX formula, readability was calculated by dividing the number of words in each reading passage by the number of sentences and adding that total to the number of long words (words over six letters) multiplied by 100 and divided by the number of words in the passage. A LIX readability score of 20 means that the text is very simple, while a score between 50 and 60 and over 60 indicates that the text is complex and very complex, respectively [26, 31, 58].

IFRS adoption (Independent variable)

The adoption of IFRS was measured by a dummy variable that takes the value 1 in the post-adoption period and the value 0 in the pre-adoption period.

Control variables

Consistent with previous studies, the study included four control variables. Table 2 shows the control variables included in the study and their measurement.

Based on the above, the study uses the following models:

$$\begin{aligned} \mathrm{READ}_{pages} = a + \beta_1\mathrm{IFRS} + \beta_2\mathrm{SIZE} + \beta_3\mathrm{PROF} \\ + \beta_4\mathrm{LEV} + \beta_5\mathrm{SECT} + \varepsilon \ldots\ldots \end{aligned} \tag{1}$$

$$\begin{aligned} \mathrm{READ}_{mega} = a + \beta_1\mathrm{IFRS} + \beta_2\mathrm{SIZE} + \beta_3\mathrm{PROF} \\ + \beta_4\mathrm{LEV} + \beta_5\mathrm{SECT} + \varepsilon \ldots\ldots \end{aligned} \tag{2}$$

$$\begin{aligned} \mathrm{READ}_{lix} = a + \beta_1\mathrm{IFRS} + \beta_2\mathrm{SIZE} + \beta_3\mathrm{PROF} \\ + \beta_4\mathrm{LEV} + \beta_5\mathrm{SECT} + \varepsilon \ldots\ldots \end{aligned} \tag{3}$$

where

READ_{pages} = Readability measured by the number of pages of the annual report

READ_{mega} = Readability measured by the number of megabytes of the annual report

Table 2 Measurement of control variables

Variable	Measurement
Company size (SIZE)	Company size was measured using log10 of the book value of the total assets at the end of the fiscal year
Profitability (PROF)	Profitability was measured by return on assets (ROA), which was calculated as follows: ROA = Net profit after tax (Zakat)/Total assets
Leverage (LEV)	The leverage was measured through the debt ratio, which was calculated as follows: Debt ratio = Total liabilities/Total asset
Business sector (SECT)	The business sector is a dummy variable that takes the value of 1 if the company is in the industrial sector and 0 if not

READ $_{lix}$ = Readability measured by the LIX readability index

Analysis and results

Descriptive statistics

Table 3 presents descriptive statistics for the study variables. It reports the minimum, maximum, mean, and standard deviation of the six variables of the study (one dependent variable and five independent variables). As for the readability measured by the number of pages of the annual report, it is clear from Table 3 that the mean number of pages in the pre-adoption period was 39 pages with a standard deviation of 13 pages, while the mean number of pages in the post-adoption period was 66 pages with a standard deviation 17 pages. This result means that the adoption of IFRS increased the number of pages of the annual report, which refers that the annual reports in the post-adoption period became less readable compared to the pre-adoption period. The same result can be obtained by looking at the readability, which is measured by the number of megabytes. It is noted from Table 3 that the mean number of megabytes in the pre-adoption period was 1030 megabytes with a standard deviation of 532 megabytes, while the mean number of megabytes in the post-adoption period became 2313 megabytes with a standard deviation of 687 megabytes. This result also indicates an increase in the difficulty of reading the annual report in the post-adoption period compared to the pre-adoption period. Regarding the readability measured by the LIX formula, Table 3 shows that the mean LIX score in the pre-adoption period was 46.7 with a standard deviation of 4.4, while the mean LIX score in the post-adoption period was 57.6 with a standard deviation of 6.3. This result also confirms the increased difficulty of reading the annual report in the post-adoption period compared to the pre-adoption period.

Significance of mean differences

Table 3 shows that there are differences in the means for the three measures of readability in the two periods, pre- and post-adoption of IFRS. To test the significance of these differences, two independent sample *t* test and Wilcoxon matched-pair test were performed. Table 4 presents the results of these tests. As shown in Table 4, it can be said that the differences between the

Table 3 Descriptive statistics

Variable	Observations (company/year)	Minimum	Maximum	Mean	Std. deviation
Pre-IFRS					
$READ_{pages}$	201	27	67	39	13
$READ_{mega}$	201	434	1820	1030	532
$READ_{lix}$	201	39.3	63.1	46.7	4.4
Post-IFRS					
$READ_{pages}$	201	42	109	66	17
$READ_{mega}$	201	699	4040	2313	687
$READ_{lix}$	201	46.8	71.2	57.6	6.3
Control variables					
SIZE	402	14.71	26.43	19.62	4.356
PROF	402	−0.29	0.43	0.24	0.127
LVR	402	0.17	0.41	0.28	0.109

Table 4 Mean difference test

Readability measure	Wilcoxon test		*t* test	
	Z-Statistic	*p* value	t-Statistic	*p* value
Pages	4.35	0	2.248	0.001
Megabytes	5.77	0	3.169	0.003
LIX formula	4.91	0	5.352	0.006

means of the three measures of readability are significant at a significant level of $p \leq 0.05$.

Correlation analysis

The study performed a multicollinearity test to examine the correlation among the independent variables. Table 5 presents the matrix of correlations and variance inflation factor (VIF). As shown in Table 5, all independent variable shows a VIF value smaller than 10, which means that there is no multicollinearity at a significant level of $p \leq 0.05$. Through VIF values, it can be concluded that the regression model is free from the assumption of multicollinearity.

Multivariate regression analyses

Table 6 presents the results of multiple regressions results. As shown in Table 6, the three study models are significant as the F-statistics are significant at the level of $p \leq 0.05$. It is clear from Table 6 that the coefficients of the IFRS are 2.97, 3.89, and 3.71 in Model 1, Model 2, and Model 3, respectively, and that these coefficients are significant at a significant level of $p \leq 0.05$. This result indicates that the adoption of IFRS has a positive and significant impact on the number of pages of the corporate annual report, the size of the annual report as measured by the number of megabytes as well as the LIX score. This means that the adoption of IFRS leads to an increase in the difficulty of reading the corporate annual reports, which leads to accepting the hypothesis of the study that the adoption of IFRS negatively and significantly affects the readability of the corporate annual reports. About the control variables, it is noted from Table 6 that the coefficients of the company size are 4.29, 3.06, and 4.34 in Model 1, Model 2, and Model 3, respectively, and these coefficients are significant at a significant level of $p \leq 0.05$. It is also noted that the profitability coefficients are − 3.11, − 2.2, 1, and − 3.67 in Model 1, Model 2, and Model 3, respectively, and these coefficients are significant at a significant level of $p \leq 0.05$. These results

Table 5 Correlation analysis

	IFRS	SIZE	PROF	LVR	SECT	VIF
IFRS	1.00					1.86
SIZE	0.016	1.00				2.02
PROF	0.127	0.214**	1.00			1.23
LVR	0.211	0.019	0.124	1.00		1.45
SECT	0.014	0.234	0.301**	0.216	1.00	1.98

**Represents significant at $p \leq 0.10$

Table 6 Multivariate regressions results

Model 1 (Pages)				Model 2 (megabytes)				Model 3 (LIX)			
Variable	Coefficient	t-Statistic	Sig.	Variable	Coefficient	t-Statistic	Sig.	Variable	Coefficient	t-Statistic	Sig.
IFRS	2.97	3.89	0.00*	IFRS	3.89	3.17	0.00*	IFRS	3.71	5.34	0.00*
SIZE	4.29	2.97	0.00*	SIZE	3.06	2.49	0.00*	SIZE	4.34	3.86	0.01*
PROF	− 3.11	− 2.58	0.01*	PROF	− 2.21	1.98	0.03*	PROF	− 3.67	2.68	0.00*
LVR	3.67	2.97	0.11	LVR	4.01	3.32	0.09	LVR	4.34	3.98	0.07
SECT	2.43	1.83	0.1	SECT	2.69	1.69	0.08	SECT	3.01	2.97	0.09
Observations	402			Observations	402			Observations	402		
Companies	67			Companies	67			Companies	67		
R-squared	0.1787			*R*-squared	0.1981			*R*-squared	0.1921		
F-statistic	4.71*			F-statistic	3.26*			F-statistic	4.86*		

*Represents significant at $p \leq 0.05$

indicate that the company size has a positive and significant impact on the number of pages of the annual report, the size of the report as measured by the number of megabytes as well as the LIX score, and thus increases the difficulty of reading the annual report. These results also indicate that the company's profitability has a negative and significant impact on the number of pages of the annual report, the size of the report as measured by the number of megabytes as well as the LIX score, thus reducing the difficulty of reading the annual report. The coefficients for the sector in which the company operates are 2.43, 2.69, and 3.01 in Model 1, Model 2, and Model 3, respectively. It is noted that these coefficients are not significant at a significant level of $p \leq 0.05$, which indicates that both leverage and the sector in which the company operates have no significant impact on the number of pages, the size of the annual report, and LIX score, and therefore, they have no significant effect on the readability of the annual report.

Discussion

The previous results conclude that the adoption of IFRS in Saudi Arabia resulted in a decrease in the readability of the corporate annual report. This result is consistent with the results of similar studies conducted in other countries, which provided evidence that the adoption of IFRS has made the corporate annual report more difficult to read and thus negatively affected the readability of the corporate annual report (e.g., [22, 43, 63, 64, 69]). The results also conclude that the company's size negatively affects the readability of the corporate annual report, while the company's profitability positively affects the readability of the corporate annual report. These results are consistent with the results of several previous studies conducted in other countries, which provided evidence that larger companies tend to publish less readable reports, while more profitable companies tend to publish more readable reports (e.g., [2, 11, 36, 52, 56]). Contrary to the results of previous studies (e.g., [30, 53]), the results of the current study conclude that both leverage and the sector in which the company operates have no significant impact on the readability of the corporate annual report. This result can be explained by referring to the nature of the Saudi market. The Saudi market is basically a stock market. Companies borrowing through the issuance of bonds is a difficult matter as a result of the lack of demand for them because the fixed interest of bonds is one of the things forbidden in the Islamic religion. This makes the level of financial leverage low in most Saudi companies, whether before or after the adoption of the standards. As for the sector in which the company operates, it was measured, like previous studies, through a dummy variable that takes 1 if the company belongs to the industrial sector and zero if the company belongs to any other sector. In this regard, it is noted that Saudi Arabia is not an industrialized country, and therefore does not have complex industries. This means that most of the industrial companies in the sample belong to basic industries that do not differ significantly in their complexity from the rest of the companies operating in other sectors. However, the results of this study should be taken with caution for two reasons. First, the study used a small sample due to the small size of the Saudi stock exchange during the study period. Second, this study relied on simple measures of readability, namely the length of the annual report which was measured by the number of pages, the size of the annual report which was measured by the number of megabytes, and the LIX formula. The reason for this is that the corporate annual reports of Saudi companies are published in the Arabic Language, which means that it is not possible to use the readability measures used by studies conducted in developed countries such as Fog Index, Gunning's Fox Index, Flesch–Kincaid Grade Level, and Flesch Reading Ease (FRE) formula. These metrics fit reports published in English. Despite this caution, this study has some practical implications. First, this study shows the urgent need to develop readability measures for Arabic texts that consider the linguistic characteristics of the Arabic language, similar to the measures that were developed for the English language, so that they can be widely used for Arabic texts. The existing readability measures are only suggested measures that were developed specifically to measure the readability of the curricula in the first grades of education and therefore cannot be widely used for measuring the readability of texts written in the Arabic language. Second, this study provides an indication to the Saudi Capital Market Authority that the size of corporate annual reports for Saudi companies has become significantly larger in the period after the application of IFRS, which leads to a decrease in their readability. This entails searching for possible actions to reduce the size of these reports and thus increase their readability.

Conclusion, limitations, and suggestions

The corporate annual report is the official mean of communication between the company and its stakeholders. Considering that the annual report is one of the important sources through which stakeholders obtain the information they rely on in making their decisions, this report must be clear and readable. Some previous studies confirmed that the adoption of IFRS entails more disclosures and consequently an increase in the length of the corporate annual report which resulted in difficulty in reading and understanding it. This study aimed to examine the impact of the adoption of IFRS on the readability of corporate annual reports in Saudi Arabia as one of the developing countries that adopted the IFRS starting in 2017. Based on a sample of companies registered on the Saudi Stock Exchange during the period 2014–2019 and using three measures of readability, the study concluded that the adoption of IFRS has made it more difficult to read corporate annual reports of Saudi companies, which means that the adoption of IFRS negatively affected the readability of the corporate annual reports of Saudi companies. This study contributes to the literature in two respects. First, this study contributes to the readability literature by examining the readability of the corporate annual report in a developing country that has not been examined before and in which the corporate annual report is prepared in Arabic. Second, this study contributes to the literature on the economic consequences of IFRS adoption by examining the impact of adopting IFRS on the readability of the corporate annual report.

This study has implications for different stakeholder groups. For the authority responsible for setting Saudi accounting standards (SOCPA), this study presents new findings regarding the impact of adopting IFRS on the textual features of the company reports. For Saudi policymakers and regulators, this study shows that Saudi companies do not have highly understandable reports due to excessive length and reduced readability which makes it useful only for experienced users. This study informs Saudi policymakers and regulators of the difficulties in readability resulting from the translation of International Financial Reporting Standards (IFRS) into Arabic, which is useful with regard to the future if the scope of adoption of the International Financial Reporting Standards is expanded or even in the translation of any possible amendments to the standards that have been adopted.

However, this study is not without limitations. First, the study has used a small sample due to the small size of the Saudi stock exchange during the study period. With the increasing growth of the Saudi stock exchange shortly, with the Saudi government adopting several initiatives to stimulate the private sector and encourage it to list its shares in the exchange market, future studies can use samples of a larger size and then reach more generalizable results. Second, the study has used a sample of non-financial companies and excluded financial companies such as banks and insurance companies. Future studies can examine the readability of corporate annual reports for this type of companies. Third, the study has relied on three simple measures to measure the readability of the corporate annual report. Future studies could investigate the possibility of using more sophisticated measures of readability.

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