Information Sciences Letters
*An International Journal*

http://dx.doi.org/10.18576/isl/130310

# Annual Report Readability and Information Disclosure Quality: Evidence from Tunisia

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Received: 1 Nov. 2023, Revised: 16 Feb. 2024, Accepted: 16 Feb. 2024.
Published online: 1 May 2024

**Abstract:** The current paper examines the impact of the readability level of annual reports on the quality of information disclosure for Tunisian context. Namely, using the data analysis, empirical study is conducted through a linear regression model linking the dependent variables (disclosure score) and independent variables in terms of readability score, managerial property, the price earnings ratio as well as the financial profitability. It is revealed that the quality of information is considerably correlated to the readαability of annual reports. For instance, we show that lessening managerial property leads to disclosure of information enhancement by the manager. Among the main findings, it is observed that the disclosure score (DSCORE) decreases with managerial property (PMAN) with a coefficient value of ($\alpha_1 = -89.11$) revealing a significant association at 1% level ($P > t = 0.000$) and confirming the results from literature. Analysis also demonstrates the positive correlation between the company performance and disclosure level that is further confirmed with respect to results predicted by other authors. Our findings complement prior research in the field of information disclosure of annual reports with relation to readability level and present an effective methodology to measure the difficulty of the text while verifying the originality of strategic, financial, and nonfinancial information.

**Keywords:** Information Disclosure, Readability Analysis, Annual Reports, Tunisian Firms.

## 1 Introduction

The quality of information disclosure is a subject that has been widely discussed in the accounting and financial literature [1-14]. However, only few studies are conducted on association between the readability of annual report and the quality of the disclosure of information in Tunisia [15-17]. Strong growth in market capitalization, information broadcasting, growing internationalization of the activities of large companies and financial crisis are the reasons why questions by users on the annual reports have arisen. Consequently, users require transparent information which is of quality and readable [18, 19]. According to Diamond and Verrecchia [20], Hopkins [21], information is considered of a good quality when investors believe in the firm value, read, and interpret it easily. In addition, Fernbach [22] stated that a text is readable if only it is quickly read, understood and memorized. The Tunisian companies listed on the Exchange Securities are required to improve their financial communication voluntary and regularly, so that the stock exchange could evolve. However, some companies fail to disclose information and submit unreadable annual reports to users despite the fact that annual reports are important sources that communicate a particular image of the company [23]. For this purpose, readability formulas are developed [24-29]. They are defined as mathematical equations thinking ahead the reading difficulty of the linguistic features of the written passages [30]. This method allows detecting false information in annual reports, anticipating threats and opportunities and therefore testing the sincerity of the company. Therefore, the interest to tackle such a topic. Nevertheless, the earlier work dealing with this subject generally focuses on factors determining the level and content of disclosed information. It is about business performance [31-33] and the size of the firm [34, 35]. While other authors focus on the consequences of disclosure policy on the behavior of managers [36, 37] and financial analysts [38-40], Li [41] examines a new measure of disclosure level: the level of readability of annual report given that, according to him, an unreadable annual report leads to a bad quality of disclosure. This reveals then the interest in addressing the question of the readability impact of the annual report on the quality of the information disclosure. We intend here to tackle this problem based on experimental studies of Botosan [42] and Matoussi et al. [43]. To address this problem, we propose a model that incorporates variables of various researchers presenting the determinants influencing the quality of disclosure as the managerial ownership, the capitalization coefficient of profits and financial return with the addition of a variable on readability.

On another hand, the growing interest in the field of disclosure information has seen significant growth in recent years for multiple country contexts, as evidenced by the abundant literature dealing with this field of interest [44-49]. For

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instance, Nguyen and Kimura [50] examine the associations between two of the most interesting disclosure characteristics of information asymmetry and annual reports and. They declare that the annual report length is associated negatively with information asymmetry while an improvement in the readability of annual reports does not have a positive impact on the information asymmetry among investors. However, despite this progress, and to the best knowledge of the authors, the studies dealing with the readability level impact on the disclosure of annual reports in Tunisia remain still scarce and insufficient. Among these few studies, Chakroun and Hussainey [51] follow the Beest and Braam [52] approach to examine the disclosure quality and its determinants in the Tunisian context. The authors use a sample of 56 annual reports from non-financial companies listed on the Tunisian Stock Exchange for the years 2007 and 2008 to discuss whether the disclosure quantity and disclosure quality share the same determinants. Their results reveal that there are different determinants of disclosure quality and quantity. In the same vein, Matoussi and Chakroun [53] analyze the interactions between the composition of the board of directors, ownership concentration and voluntary disclosure in annual reports using panel data of Tunisian listed firms that do not belong to the financial sector between 2003 and 2005. It is shown that the extent of voluntary disclosure tends to rise over time. Besides, the authors claim that the independence and the structure of the leadership of directors' board and the familial control of the firm doesn't lead to more voluntary disclosure.

From this point of view, and to fill these literature gaps related to Tunisian context and advance the study field, this investigation seeks to evaluate the quality and readability of the information contained in the annual report of Tunisian companies traded on a 3-years period between 2020 and 2022.

The remainder of the paper is proceeded and structured as follows. Section 2 is devoted to research on factors influencing the level of disclosure. The hypothesis will be presented in Section 3. In Section 4 we discuss samples and data collection followed by analysis and results discussion presented in Section 5. Finally, the article is summarized with concluding remarks and future research perspective.

## 2 Disclosure of information

### *2.1 Factors influencing the level of disclosure*

Many authors define the quality of disclosure in multiple researches and with different perspectives. Today, company stakeholders require high quality disclosure of annual reports with sufficient and clear information [54]. Botosan [42] denies the existence of universal accepted notion of disclosure quality. Despite the declaration of Botosan [42], the International Accounting Standards Board (IASB) [55] declare that the disclosure in general is defined as "information about the reporting entity that is useful to present and potential equity investors, lenders and other creditors in making decisions in their capacity as capital providers". In fact, demand for disclosure quality or decision-useful information is derived from the asymmetry of information and agency conflicts between the outsiders (stakeholders) and insiders (managers). Therefore, for the annual reports' users, enhancing the disclosure quality diminishes accordingly the information asymmetry.

On another hand, Diamond and Verrecchia [20] describes the information disclosure as a belief of investors about the value of the firm. Similarly, Hopkins [21] considers that financial information is of good quality when investors read and interpret information easily. Some studies find that the quality of disclosure is associated with certain characteristics of the firm. This lets measuring the level of disclosure in annual reports with a score or an index of disclosure. This association is noticed at Singhvi and Desai [31], who analyze, by a disclosure score, the quality of disclosure in the financial statements of firms in the Middle East. They conclude that a firm reveals more beneficial information to the public for enhancing its positive performance. Likewise, Lang and Lundholm [56] analyze five annual reports of 751 U.S. firms between 1985 and 1989. They note that the disclosure scores are higher for firms of good performance and large size. They find a positive relationship between company performance and the quality of disclosure. Lang and Lundholm [56] also note that firms holding unfavorable information (mainly information on income) may wish to disclose more information to increase their credibility or to minimize the likelihood of legal liability. Firth [34] measures the impact of American firms' characteristics on the disclosure of information. He reviews the annual reports of firms. He finds a positive association between firm size and disclosure of information. Moreover, King and Wallin [57] state that large firms are characterized by better disclosure policies giving that the incentives to acquire private information are greatest. Alsaeed [35] assesses the level of disclosure in annual reports for fiscal 2003 of Saudi firms. He chooses a sample of 40 firms representing 56% of all Saudi Arabian firms. The author also examines the relationship between characteristics of firms and the extent of voluntary disclosure by a linear regression model with multiple variables. Alsaeed [35] finds a significant positive association between the firm size and the level of disclosure. Recently, Aldoseri and Melegy [58] assume a correlation between the readability of the annual financial report of Saudi firms and the information efficiency as well as stock liquidity. The authors hence recommend that professional organizations and companies are advised to work on improving the readability of annual reports, in addition to

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analyzing the factors affecting it. They also suggest reviewing both voluntary and mandatory disclosure requirements.

*2.2 Reaction of the firm with the costs*

Other studies examine the reaction of the firm with the costs. Grossman [59] stipulates that companies voluntarily disclose information when the market has rational expectations. The voluntary disclosure reduces the cost of revelation. Given that firms disclose good news and withhold bad, therefore for the market, the nondisclosure is translated by unfavorable news. This will reduce the share prices of firms until they do not disclose their information. Depoers [60] uses the annual reports of fiscal year 2005 of 102 French industrial and commercial enterprises while assessing the extent of disclosure by the score based on financial and nonfinancial discretionary information. He concludes that the publication of financial and nonfinancial quality by the leader causes a reduction in agency costs. Diamond [61] presents positive theory of voluntary disclosure of information by firms. He uses a general equilibrium model to show that a disclosure policy maximizes the value of the firm and well-being of shareholders. He demonstrates a positive association between the quality of financial reporting and the level of asymmetry. Diamond and Verrecchia [20] analyze the relationship between the cost of capital and the level of disclosure of information. They use a theoretical model of disclosure based on liquidity. They conclude that greater disclosure enhances stock market liquidity and reduces the costs of equity due to lower transaction costs or an increase in demand for equities. Hasan and Habib [62] demonstrate that firms with less readable disclosures hold significantly more cash and argue that this relationship is stronger for firms with higher financing constraints and refinancing risks and weak corporate governance. Barker [63] also argues that greater disclosure leads to a lower cost of equity when the objective is to maximize share price. Bushee and Leuz [64] chooses a sample of 6,513 U.S. firms listed on the bulletin board of financial instruments. They find a negative relationship between disclosure quality and cost of equity if the disclosure is credible and not personal. Eng and Mak [65] utilize a sample of 158 firms listed on the Singapore Stock Exchange Securities. They predict the relationship between cost of debt and the level of disclosure of information by a regression model with multiple values. The authors calculate a score of disclosure and conclude that firms with lower cost debt disclose more information. Mazumdar and Sengupta [66] evaluate American firms preparing detailed disclosures to cope with low costs of equity and low debt. The firms' sample is characterized by reduced interest costs on contracts for personal debts. For this, the authors consider 173 new personal debt between 1989 and 1993 and conclude that firms with higher ratings of disclosure information have lower cost debt. Francis et al. [67] observe a sample of 34 countries outside the United States. They study how legal and financial systems could act on the disclosure of information. Besides, they analyze the incentives and consequences of disclosure on the cost of capital for a group of firms. They claim that profitable firms with greater external financing needs have higher levels of voluntary disclosure of information that will lead to lower costs of debt and equity capital. Li [41] assesses a sample of 55719 firms between 1994 and 2004 and provides evidence that when leaders are concerned about the dispute, they reveal information sooner.

## 3 Analysis of the readability

*3.1 Definition and characteristics of Readability*

Fernbach [22] defines the readability as the ability of a text to be quickly read, understood, and stored. Klare [68] states that readability refers to the qualities of writing that are related to the reader's understanding. According to Loughran and McDonald [69], the readability is defined as the "effective communication of valuation-relevant information". Readability and comprehensibility are inseparable concepts according to Préfontaine and Lecavalier [70].

On the other hand, there are two types of readability: linguistic readability and typographical readability. Some characteristics of the writing mentioned by Fernbach [22] prevent easy reading and good understanding: too long sentences, the misuse of substantives (articles, demonstrative pronouns, possessive, etc..), too long Words or synonyms; screen language: words or phrase placed between two words; the depersonalization: the writing must not be banal, anonymous; the detachment: the writing must not depart from the referents. There are several rules regarding fonts. Lebrun and Berthelot [71] indicate that the wheelbase of the characters and their size are factors pointing it better readability. Moreover, these authors show that the use of uppercase, inclined letters (italic), and spacing between letters, reduces the speed of reading. To enable better reading, according to GélinasChebat et al. [72], it is better to use: the same font for all text; a normal character instead of a condensed character; a font square and not elongated.

*3.2 Readability of annual report*

Once a year, company managers present to shareholders an annual report. The annual report is one of the most important documents and most often consulted [73-75]. Preston et al. [23] consider that the annual reports serve the organization as a "sales pitch carefully maneuvered" as a means to communicate a particular image of the organization. Scholes and Clutterbuck [76] stipulate that the parties, according to their own strategies, read the same

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reports. Some authors for instance in the United Kingdom [77, 78], in Australia [79, 80], in Canada [81, 82], in the United States [83] and in Hong Kong [84], after reviewing the letter from the chairman, the audit report and notes to financial statements, conclude that annual reports are difficult to read. According to Robert et al. [85], the reading component of the annual report requires 90 minutes. Indeed, the most demanding components are notes complementary to financial statements (15 minutes), the income statement (9 minutes), the balance sheet and projects (8 minutes for each one). However, the shortest ones are the auditor report and the composition of the Board of Directors (2 minutes each one). In addition, Robert et al. [85] show that the first four components that are read are the income statement, balance sheet, analysis of stock prices and the cash flow statement. However, review results, projects and objectives are hardly read, segment information and forecasts do not attract attention. Other researches focus on variables influencing the readability of written documents. Buswell [86] conducts a study on 1,000 adults from Chicago having different levels of education. He shows that persons' qualifications are improved when years of education increase. Moreover, this author states that education guides readers to read more and that reading leads to greater reading skill. More recently, Wang et al. [87] argue that annual reports with higher overall information disclosure quality is more likely to have lower readability in management discussion and analysis part. Entin and Klare [88] find an association between the readability of the text, prior knowledge, and interest of readers. Indeed, by analyzing a sample of 66 students enrolled in psychology courses at Ohio University, it is concluded that the text should be easy for those with less knowledge and interests. In addition, readers can better understand materials written at their reading levels. Klare [89] shows that humans use words more often than others, they identify the most frequently used words, faster and understand more easily. Schramm [90] demonstrates that when the text is readable, readers continue to read. Similarly, Swanson [91] studies a version of a simple story of 131 syllables per 100 words and a hard version of 173 syllables and gives them to 125 families. He notes that for 30 hours, 93% of the total paragraphs of the easy version are read compared to the hard version. This author concludes that greater readability improves retention of reading. Some authors have different formulas for measuring the level of readability. The formulas of Flesch [92] were applied to annual reports. They are inexpensive, simple, understandable; the technique is fast. Courtis [93] states that this formula provides meaningful information and predictive but linked to its ability to measure the elements (content, style, format and organization of writing). Understanding the reader will depend on it. The Flesch [92] Reading Ease Formula is expressed as:

$$\boldsymbol{Reading\ Ease\ formula} = 206.385 - 0.84 * \boldsymbol{W} - 1.015 * \boldsymbol{S} \quad (1)$$

Here,

$\boldsymbol{W}$ : is the word length (number of syllables per 100 words)

$\boldsymbol{S}$: refers to the length of the sentence (total number of words on the total number of sentences). However, Adelberg [94] notes that the method of Flesch [92] is designed only to written material of the primary school and not for the communications of adults. Adelberg and Razek [95] use a sample size that the adequacy is uncertain. So long passages selected may not be long enough and numerous enough to represent manuals. Courtis (2004) notes that Formula Flesch [92] is based on reading material for children in the United States and is not confirmed on the reading materials for adults.

The second measure of the level of readability is the formula of Gunning [96]. According to Gunning [96], Gunning index is an indicator of text comprehensibility. The more the index value is below, less the text is complex and less the player has difficulty of reading and understanding [97]. Shuptrine and Moore [98] encourage the application of indices of Gunning [96] rather than the scores of Flesch [92] since they are easier to use and interpret. Kaminski and Clark [99] stipulate that the index of Gunning [96] uses the average length of sentence and the percentage of hard words for a sample of 100 words to measure the reading difficulty of a passage. According to these authors, the index number represents the level of education required for easy reading and understanding of written material. According to Mitzner and Schramm [100], reading popular magazines requires a readability between 9 and 12.

The Index of Gunning is defined as follows:

$$\boldsymbol{F} = 0.4 * (\boldsymbol{W} + \boldsymbol{L}) \quad (2)$$

Where:

$\boldsymbol{F}$: is the Fog Index ; the more F is bigger, the less the text is readable.

$\boldsymbol{W}$: denotes the average length of the sentence determined by the total number of words within a statistically selected text of 100-200 words divided by the number of sentences.

$\boldsymbol{L}$: is the percentage of polysyllabic words as measured by the number of words of three syllables or more, and divided by the number of words in the passage (4 syllables or more in French given that the words are on average longer).

Lehner [97] outlines the rules for calculating the index of Gunning [96] based on the following:

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- Selecting a sample from written material;
- This equipment is chosen at random and should contain about 100 words;
- This sample should start and finish with a complete sentence;
- The number of sentences and the number of hard words (three syllables or more) in the sample of 100 words are counted.

Li [41] explains that the index corresponds to the number of years of education required by a reader with an average intelligence to read the text and understand it.

**Table 1:** Index of Gunning [96]

| **Text level** | **Fog index** |
|---|---|
| Unreadable | Fog ≥ 18 |
| Difficult | 14-18 |
| Ideal | 12-14 |
| Acceptable | 10-12 |
| Childish | 8-10 |

Source: Li [41]

Li [41] presents the advantages of applying this formula: it is known and simple; assuming that the text is logical, the author seized the complexity of the text according to syllables per word and words per sentence. Nonetheless, according to Kaminski and Clark [99], some polysyllabic words generated by the combination of words are not considered difficult words, just as forms of verbs in the English language ending with "ing, ed, es". Heath and Phelps [101] report that some words like proper names, product names, names of subsidiaries in the annual reports are not incorporated into the count of words. They add that if these terms are included, the length of sentences would be longer and thus would tend to reduce readability. Moreover, they cite other limitations given that the methodology of Gunning ignores the level of understanding of jargon by readers, and that the financial section requires accounting and managerial terms. Thus, these authors show that some reports use more jargon than others. Heath and Phelps [101] state for the same study in England that employees do not understand the jargon or the arithmetic in the reports of the firm. The authors further claim that the effects of typography and graphics must be understandable. Similarly other measures of readability should be chosen to see if the Fog Index [96] is valid and if the others are more applicable, reliable and valid (Table 1).

## 4 Main Hypothesis

As aforementioned, this article analyzes the impact of the readability of annual reports on the quality of disclosure. According to Courtis [81] who analyzes the message of the board of directors using a sample of annual reports of the fiscal year 1982 of 46 Canadian companies and the fiscal year of 96 Canadian firms in 1983, firms with low readability are marked by bad news and by high levels of financial pressure. For instance, using a sample of 60 annual reports of two groups of recipient firms showing a deficit, Subramanian et al. [102] observe the relationship between financial performance and readability. They note a significant difference between these two groups. They conclude that the annual reports of successful firms are easier than those of lowly performing firms. Yet, Smith and Taffler [103] study the existence of an association between the report of chairman of the directors' board and the bankruptcy of the firm. They note that the annual report is associated with the firm's performance. They conclude that a good financial performance is associated with a message obscuring the communication of accounting statements. Bloomfield [104] states that if the information is more difficult to extract from public disclosures, the markets react less. In addition, managers darken information when firm performance is bad. By applying the formula of Gunning [96], Li [41] chooses on a sample of 55,719 U.S. firms between 1994 and 2004 to measure the readability of annual reports. He notes that the annual loss firms are difficult to read, they are long, and have a high score of Gunning. He concludes that the annual reports of long sentences and big words are associated with loss-making enterprises (or with bad news) or with passenger revenues. Li [41] also observes that the readability of annual report and the persistence of income are correlated. Indeed, when firms are profitable with a more complicated report, the persistence of earnings declines. Also, Li [41] shows that complicated annual reports increase the costs of revelation to investors and therefore the quality of the information in these documents would be bad. This can lead us to pose the following hypothesis:

**H1***:* The readability of annual reports increases with the quality of disclosure.

## 5 Sample and Data

Our sample includes 28 Tunisian companies from different sectors (industry, insurance, bank...) listed on the Stock

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Exchange of Securities of Tunis. Table 2 summarizes the definitions of all variables used. The data are collected from activity reports from stock market intermediaries and from the websites of the Tunis Stock Exchange BVMT (Tunis Stock Exchange) referring to the French acronym ("Bourse de Valeurs Mobilières de Tunis"), CMF (Council of Financial Markets) referring to the French acronym ("Conseil des Marchés Financiers") and TUSTEX during the period between 2020-2022.

**Table 2:** Summary of explanatory variables

| Variables | Definition | Measure |
|---|---|---|
| Dependent Variable | | |
| $\boldsymbol{DSCORE_{it}}$ | Disclosure score | Disclosure Score Number of points awarded to companies based on their level of disclosure $\boldsymbol{DSCORE_{it}} = \frac{\sum_{j=1}^{5} Score}{Score\ max}$ |
| Independent Variable | | |
| $\boldsymbol{GSCORE_{it}}$ | Readability score | Gunning Formula [96] $\boldsymbol{F} = 0.4 * (\boldsymbol{W} + \boldsymbol{L})$ |
| Control Variables | | |
| $\boldsymbol{PMAN_{it}}$ | Managerial Property | Share of common stock held by managers of the company |
| $\boldsymbol{PER_{it}}$ | Price Earnings Ratio | $\frac{\text{Prices at the end of year}}{\text{Earnings per share}}$ |
| $\boldsymbol{ROE_{it}}$ | Return On Equity | $\frac{RE - IMP - iDF}{KP}$ |

The methodology used in our study to measure the level of disclosure is based on the construction of an index developed by Botosan [42] and adopted for the Tunisian context by Matoussi et al. [43]. The method is to assign scores to companies according to their degree of disclosure. This index can analyze and measure disclosure in annual reports. To measure this index, it is necessary to read the annual reports of the sample firms and establish a global measure of disclosure by comparing the information presented to those on the list. In addition, the disclosure index is calculated from the ratio of the global disclosure score and the maximum disclosure score for each company and each year. The formula of Gunning [96] is most suitable for measuring the readability of annual reports thanks to its easy utilization and interpretation. In our study, we chose to measure the readability score of audit reports of Tunisian companies listed on the stock exchange securities for the fiscal years 2020, 2021 and 2022 with this method. In the current investigation, the score of Gunning [96] is calculated by the software SATO-CALIBRAGE [105]. This computer software is professionally developed by the Ministry of Education and researchers at the University of Quebec at Montreal (ATO) with the help of a committee of people working in different school settings. The SATO-CALIBRAGE is also a tool for computer processing, it classifies the text according to a scale corresponding to the number of years of schooling. Our final sample consists of 28 companies listed in the Tunisian stock exchange. This sample is constituted of 1 company from industrial sector, 1 company from food processing industry sector, 1 from the insurance sector, 7 from banking sector, 2 from commercial sector, 10 from industrial sector, 2 from investment sector, 3 from leasing sector, 1 from the sector of tourism, 1 from the sector of transportation.

## 6 Analysis of Results

We use a linear regression model to test the hypothesis formulated in the theoretical framework concerning the impact of the readability of annual reports on the quality of information disclosure. Thus, considering the control variables that influence the quality of disclosure, this model will be presented as follows:

$$\boldsymbol{DSCORE_{i,t}} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}(\boldsymbol{GSCORE_{i,t}}) + \boldsymbol{\alpha_2}(\boldsymbol{PMAN_{i,t}}) + \boldsymbol{\alpha_3}(\boldsymbol{PER_{i,t}}) + \boldsymbol{\alpha_4}(\boldsymbol{ROE_{i,t}}) + \boldsymbol{\mu_i} + \boldsymbol{\varepsilon_{i,t}} \quad (3)$$

With
$\boldsymbol{DSCORE_{i,t}}$ : Quality of disclosure
$\boldsymbol{GSCORE_{i,t}}$ : Level of readability
$\boldsymbol{PMAN_{i,t}}$ : Managerial Property
$\boldsymbol{PER_{it}}$: Price Earnings Ratio
$\boldsymbol{ROE_{it}}$: Return On Equity
$\boldsymbol{\varepsilon_{i,t}}$: Residue

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The index $i$ denotes the company (or individual dimension of data) while the index $t$ indicates the period of the study in question (2020-2022) (or temporal dimension). The $\alpha_i$ are the coefficients relating to the variables informing about the quality of disclosure and the control variables. We further use two main variables: the quality of the disclosure ($\boldsymbol{DSCORE_{i,t}}$) as a variable to explain and the level of readability of annual report ($\boldsymbol{GSCORE}$) as an explanatory variable. The control variables include managerial property ($\boldsymbol{PMAN}$), the Price Earnings Ratio ($\boldsymbol{PER}$) and the Return On Equity ($\boldsymbol{ROE}$).

Data as regards the dependent variable and independent variables are available in about 84 observations. Table 3 summarizes some descriptive statistics concerning the characteristics of our sample.

**Table 3:** Descriptive Statistics of variables used in the analysis (2020-2022)

| Variables | Number of observations | Average | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| $\boldsymbol{DSCORE_{i,t}}$ | 84 | 21.03571 | 4.808736 | 12 | 37 |
| $\boldsymbol{GSCORE_{i,t}}$ | 84 | 39.14286 | 14.76004 | 7 | 79 |
| $\boldsymbol{PMAN_{i,t}}$ | 84 | 13.62905 | 24.08876 | 0 | 73.5 |
| $\boldsymbol{PER_{i,t}}$ | 84 | 16.15775 | 31.83557 | -99.25 | 245.19 |
| $\boldsymbol{ROE_{i,t}}$ | 84 | 10.59245 | 19.12113 | -111.9 | 42.4 |

We find that average score of disclosure ($\boldsymbol{DSCORE}$) is 21.03, the maximum and minimum value are respectively 37 and 12, for a standard deviation of 4.80, the maximum readability score ($\boldsymbol{GSCORE}$) and the minimum value are respectively 79 and 7, while the average value is 39.14 and the standard deviation is 14.76. Besides, the average distribution of managerial property ($\boldsymbol{PMAN}$) is computed to be 13.63%. This dispersion is determined by the maximum and minimum value which are 73.50% and 0% respectively, and by the standard deviation which is 24.08% ; the Price Earnings Ratio ($\boldsymbol{PER}$) of the sample firms recorded a mean value of 16.16. Further, two maxima are obtained; a maximum and a minimum value which are 245.19 and -99.25 respectively and a variation with 31.83; while the average distribution of the Return On Equity ($\boldsymbol{ROE}$) of the firms corresponds to a value of 10.59%, this dispersion is determined by a maximum value of 42.40% and a minimum value of -112%. A standard deviation of 19.12% is also predicted herein. Accordingly, the Spearman correlation matrix provided by the software STATA 9.1 is then computed. Table 4 depicts the correlation between variables.

We note that the disclosure score ($\boldsymbol{DSCORE}$) is positively correlated with managerial property ($\boldsymbol{PMAN}$) (ρ = 0175), Price Earnings Ratio ($\boldsymbol{PER}$) (ρ = 0099), the Return On Equity ($\boldsymbol{ROE}$) (ρ =0.034) and the readability score ($\boldsymbol{GSCORE}$) (ρ = 0104). The univariate analysis supports the hypothesis that the level of readability ($\boldsymbol{GSCORE}$) is positively correlated with the level of disclosure ($\boldsymbol{DSCORE}$); though, the Return On Equity (**ROE**) and the level of readability ($\boldsymbol{GSCORE}$) are negatively correlated.

**Table 4:** Correlation matrix of explanatory variables

| | $\boldsymbol{DSCORE_{i,t}}$ | $\boldsymbol{PMAN_{i,t}}$ | $\boldsymbol{PER_{i,t}}$ | $\boldsymbol{ROE_{i,t}}$ | $\boldsymbol{GSCORE_{i,t}}$ |
|---|---|---|---|---|---|
| $\boldsymbol{DSCORE_{i,t}}$ | 1.000 | | | | |
| $\boldsymbol{PMAN_{i,t}}$ | 0.175 | 1.000 | | | |
| $\boldsymbol{PER_{i,t}}$ | 0.099 | 0.007 | 1.000 | | |
| $\boldsymbol{ROE_{i,t}}$ | 0.034 | 0.058 | 0.036 | 1.000 | |
| $\boldsymbol{GSCORE_{i,t}}$ | 0.104 | 0.057 | 0.038 | -0.125 | 1.000 |

Table 5 illustrates the results of linear regression with correction of the standard errors. The results of the estimates according to a model of 84 observations show that it is of medium significance. Similarly, the significance of explanatory variables is then established. The proportion to which these variables explain the average score of disclosure, is determined by $R^2$ residual reaching a value of 43.43%.

**Table 5:** Results of linear regression with correction of standard errors

| $\boldsymbol{DSCORE_{i,t}}$ | Coefficient | Standard Error | (t) | P > (t) |
|---|---|---|---|---|
| $GSCORE_{i,t}$ | 0.0659434 | 0.0390461 | 1.69 | 0.097*** |
| $PMAN_{i,t}$ | -89.11264 | 16.76805 | -5.31 | 0.000** |
| $PER_{i,t}$ | 0.0310557 | 0.0104778 | 2.96 | 0.005*** |
| $ROE_{i,t}$ | 0.0184036 | 0.0224045 | 0.82 | 0.415 |
| $CONST_{i,t}$ | -1191.21 | 228.6129 | -5.21 | 0.000** |

*** Significance at 10%

** Significance at 1%

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Close scrutiny of Table 5 illustrating regression results between the disclosure of information and the factors influencing demonstrates that the level of disclosure (***DSCORE***) and the level of readability (***GSCORE***) are positively correlated ($\alpha_4$ = 0.0659, t = 1.69 ) while their relationship is observed to be significant at a level of 10% (P > t = 0097). This confirms our hypothesis and the quotation of Li [41] who shows that the unreadable annual reports increase with the costs of disclosure to investors causing a bad quality of information. Furthermore, companies submit annual reports with long sentences and big words when results are showing a deficit. We also observe that the level of disclosure (***DSCORE***) decreases with managerial property (***PMAN***). Indeed, the coefficient value ($\alpha_1 = -89.11$) and this association is significant at 1% level (P> t = 0.000) which confirms the results of Eng and Mak [65]. The manager provides more information when it has less share. Thus, it will tend to increase incentives such as stock options [106]. Accordingly, this disclosure is expected to reduce the share price [107]. We also show that the Price Earnings Ratio (***PER***) and the level of disclosure (***DSCORE***) are positively correlated ($\alpha_2 = 0.031$) and their relationship is at a significant level of 1% (P > t = 0.005). This confirms the results of Eng and Mak [65], the Return On Equity (***ROE***) and the level of disclosure (***DSCORE***) are positively correlated ($\alpha_3 = 0.018$) and their relationship is not significant (P> t = 0415). Our results are observed to be similar to those available in literature. In this vein, Singhvi and Desai [31] reports that a profit firm reveals more information to the public in the aim of enhancing its positive performance.

## 7 Conclusions and perspective

In the current study, the impact of the level of readability of annual reports on the level of information disclosure is examined. We present a model of linear regression linking a dependent variable (the disclosure score) and independent variables (the score of readability, the managerial property, the Price Earnings Ratio and the financial profitability) to show that when the annual report is readable, the information is of quality. Our methodology is to assign scores to firms according to their degree of disclosure. It is applied by calculating a score of disclosure from a scale created by Botosan [42] and adapted to the Tunisian context by Matoussi et al. [43]. In addition, a readability score calculated by the Gunning formula [96] is determined for each company and each year. We applied our methodology to 28 companies listed on the Tunisian Stock Exchange over a period ranging from 2020 to 2022. The data collection is done from websites and with intermediate exchange. The results show that the more readable is the annual report, the more it contains information of quality. This confirms our hypothesis. Furthermore, we demonstrate that a reduction in managerial property leads to an increase in disclosure of information by the manager. This one by wanting to illustrate his ability to maximize shareholder value, will thereby increase its managerial return [31]. However, shareholders would increase the control of the behavior of the manager [108]. We also demonstrate that the performance of the company and the level of disclosure are positively correlated. However, Wallace et al. [109] prove that firms showing a deficit disclose information to improve their credibility. These results are confirmed by Camfferman and Cooke [110]. Finally, it is noteworthy that the methodology of our research is subject to criticism. Indeed, on the first limit, it is explained to the small size of the sample. The second limitation is the unavailability of information concerning either annual reports or the audit reports of some companies. Additionally, the model may contain other variables representing factors influencing the quality of disclosure such as the firm size, debt ratio, the reputation of the auditor and the analyst follow-up.

However, despite these limitations, this research is useful insofar as it attempts to draw users' attention to the information content of the annual report. The methodology will enable them to measure the difficulty of the text and verify that the strategic, financial, and nonfinancial information are genuine for the Tunisian context. It would further assess the level of education needed for a reader to be able to understand, read and memorize. In addition, as the current findings may not be generalized for the information disclosure practices of unlisted companies in the Tunisian Stock Exchange, as a future perspective, we aim to enlarge the sample by including those unlisted firms and complete the study while using further disclosure sources of information namely; the press releases, web sites, and prospectuses and not only relying on annual reports as the main information disclosure source.

### *Conflicts of Interest Statement*

*The author certifies that She has NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.*

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## APPENDICES

**Appendix:** Scale used to calculate the index of disclosure.

| **INFORMATION** | | **NUMBER OF POINTS** | |
|---|---|---|---|
| **1** | **General Information about the company** | **Qualitative** | **Quantitative** |
| a | Presentation of the company objectives | 1 | +1 |
| b | Presentation of the general strategy of the company | 1 | +1 |
| c | Discussion of actions taken during the year to achieve the goals set | 1 | +1 |
| d | Presentation of a timetable for achieving the goals | 1 | +1 |
| e | Presentation of a timetable for achieving the goals | 1 | +1 |
| f | Discussion of barriers to entry | 1 | +1 |
| g | Discussion of the effect of barriers to entry into the current profits of the company | 1 | +1 |
| h | Discussion of the effect of barriers to entry on future profits of the company | 1 | +1 |
| i | Discussion of the level of competition in the market for the company | 1 | +1 |
| j | Discussion of the impact of competition on the current profits of the company | 1 | +1 |
| k | Discussion of the impact of competition on future profits of the company | 1 | +1 |
| l | General description of the activities of the company | 1 | +1 |
| m | Identification of the major products and offered services | 1 | +1 |
| n | Description of the specific characteristics of the products and the offered services | 1 | +1 |
| o | Description of the main markets of the company | 1 | +1 |
| p | Description of the main features associated with these markets | 1 | +1 |
| **2** | **Summary of the results** | ≤ 2 years | ≥ 2 years |
| a | Presentation of a return on assets or information necessary to calculate it (i.e.net income, the tax rate, the interest expense, and total assets) | 1 | 2 |
| b | Presentation of the net profit margin or of the information necessary to calculate it (i.e. net income, tax rates, interest charges, and total sales) | 1 | 2 |
| c | Introduction of asset turnover or information necessary to calculate it (i.e. the total sales and total assets) | 1 | 2 |
| d | Presentation of the return on equity or the information necessary to calculate it (i.e. net income and equity) | 1 | 2 |
| **3** | **Non-Financial information** | **Quantitative** | |
| a | Number of Employees | 2 | |
| b | Average of return per employee | 2 | |
| c | Share market | 2 | |
| d | rejection rate or defective units | 2 | |
| e | Age of key employees | 2 | |
| f | sales growth in key regions for which no segment information is produced | 2 | |
| g | Break-even | 2 | |
| h | Ratio inputs/outputs | 2 | |
| i | Sales of products in key regions | 2 | |
| **4** | **Information with projected character** | **Qualitative** | **Quantitative** |
| a | Comparison of the profit forecasts with current actual earnings | 1 | +1 |
| b | Comparison of forecasts of sales with actual sales present | 1 | +1 |
| c | Discussion of the impact of the business opportunities of the company | 2 | +1 |

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| | | | |
|---|---|---|---|
| | on future sales or profits | | |
| d | Discussion of the impact of risks facing the company on sales and future profits | 2 | +1 |
| e | Presentation of the forecasts of market share | 2 | +1 |
| f | Presentation of the forecast about the liquid assets | 2 | +1 |
| g | Presentation of the forecast about the expenditures on capital account or research and development | 2 | +1 |
| h | Presentation of forecasts profits | 2 | +1 |
| i | Presentation of sales forecasts | 2 | +1 |
| **5** | **Analysis and discussion of the direction (management report)** | **Qualitative** | **Quantitative** |
| a | Change of sales | 1 | +1 |
| b | Change in operating profits | 1 | +1 |
| c | Change in cost of goods sold | 1 | +1 |
| d | Variation of cost of goods sold as a percentage of sales | 1 | +1 |
| e | Change in spending or profits from other activities | 1 | +1 |
| f | Net change of the profit | 1 | +1 |
| g | Change in debt | 1 | +1 |
| h | Change in expenditures on capital account or costs of R&D | 1 | +1 |
| i | Change in share market | 1 | +1 |

***Source:*** *Botosan [42] adapted by Matoussi et al. [43]*

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