UNIVERSIDADE CATÓLICA PORTUGUESA

An integrated analysis of the chairman's letter and firm performance

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Resumo

O impacto do uso de narrativas financeiras complexas foi estudado e a sua ligação com o desempenho de empresas. Esta análise foi elaborada numa das secções mais importantes do relatório anual, a carta do presidente. O uso de narrativas financeiras complexas foi medido por três variáveis: *Fog Index*, *Flesch Formula* e *Log (Word Count).* Analisámos a relação destas três variáveis com duas medidas de desempenho financeiro (EPS e ROA) e uma série de variáveis de controlo, usando um modelo multivariado. Além disso, também estudamos o uso de *forward-looking words* durante períodos de crise financeira.

Após essa análise, os nossos resultados confirmam que as empresas inglesas não financeiras incluem várias narrativas financeiras complexas na sua carta do presidente sempre que o desempenho da empresa diminui. Além disso, encontramos uma relação negativa entre o uso de palavras *forward-looking words* durante períodos de dificuldades financeiras.

Palavras-chave: Narrativas financeiras complexas, desempenho financeiro, *foward-looking,* carta do Presidente.

Abstract

The impact of the use of complex financial narratives was studied and its link with firm performance. This was done by analysing one of the most important sections of the annual report, the chairman letter. The use of complex financial narratives was measured by the three variables: Fog Index, Flesch Formula and Log(Word Count). These three variables were regressed and analysed against two measures of financial performance (EPS and ROA) and a series of control variables, using a multivariate model. Furthermore, we also studied the use of forward looking words, during periods of economic struggle.

Following this analysis our results confirm that non-financial English firms include several complex financial narratives within their chairman letter whenever firm performance declines. In addition, we found a negative relationship between the use of forward-looking words during periods of financial struggle.

Keywords: Complex Financial Narratives, Firm Performance, Forward-Looking Words, Chairman Letter.

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1. Introduction

It has become of great importance to study the annual report narratives, given that these are considered key sources of information, especially when those same companies find themselves in situations of financial distress. Financial Narratives are regarded as the information presented in annual reports that is non-financial. This study focuses on establishing a link between the use of complex financial narratives and financial performance. It examines closely the use of complex financial narratives whenever firm performance worsens or increases. Furthermore, it also studies the use of forward-looking words during periods of economic boom and economic recession and its relation to firm performance. The main objective of this study looks towards finding out if indeed managers make greater use of complex financial narratives whenever their performance worsens.

Accounting and finance have recently started focusing on disclosures and are now aware of the need to understand all information available and not just quantitative data. This has increasingly become an important field of study. In addition, many researchers have investigated the association between firms' disclosure and earnings changes. The information included in the annual report such as the chairman letter are key sources of information that allow analysts to act on behalf of investors, to forecast future performance.

The focus of this research is on the chairman's letter in annual reports due to the fact it takes a prime position in the annual report. The chairman's letter presents an initial view of the firm position and its prospects for the future. It also reviews the past and upcoming projects. Thus, when discussing the past year,

the chairman's letter may include an increasingly high number of forward-looking words to divert the reader towards a better future.

Furthermore, as mentioned before the chairman's letter usually takes on a primary position within any annual report. In addition, they allow management to present a serial, annual description of corporate financial performance (Clatworthy and Jones, 2003). It's been found by Kaplan, Pourciau and Reckers (1990), that the presence of a chairman letter, can influence the judgment of individuals in equity investment decisions. The chairman letter is considered one of the most influential pieces of information within the annual report, after the financial statements, to both financial analysts and institutional investors (Arnold and Moizer, 1984).

The study of financial narratives has been increasing because of financial scandals that the world has experienced and many regulations have been updated to make firms disclose more information. Such is the case of the United States where post-Enron scandal, jurisdictions were extended and revised, whereas, in other, disclosures are becoming mandatory. In the U.K, a revised OFR (Operating and financial review) guidance was issued by the Accounting Standards Board, and company laws review are currently proposing mandatory OFRs for listed companies. Such demands look towards transparency and accountability from the firms' side (Beattie, McInnes and Fearnly, 2004).

In addition, since the 2008 economic crash, three supervisory committees were created by the European Commission to oversee its new regulation and to ensure that the European Banking System was being held accurately accountable. Thus, the study of financial narratives comes as an important aspect of research to uncover the financial distress a firm may find itself in, through the study of the annual report narratives. This research joins the academic debate that the use of financial complex narratives is related to firm performance.

Following the importance of financial narratives, it was found within this study that indeed whenever firms perform poorly or have a declining financial performance, managers make greater use of complex financial narratives. Although we could establish this relationship with only one dependent variable (Fog), it was a significant one that contributes to the literature. These findings are useful for market regulators to implement more effective policies towards the use of financial complex narratives.

The study is organized as follows: Literature Review, Methodology, Results, and Conclusion.

2. Literature Review

2.1 The limitations of quantitative information

The annual report is considered to be one the most important sources of information of any firm. The textual narrative portions of annual reports came as an important aspect to understand the real position of any firm (Abrahamson and Amir, 1996). Furthermore, the annual report is not just used to disclose information but also to frame results and manage expectations. Managers may use this information to their advantage and manipulate the reader (Souza, Rover and Borba, 2019). This may be a direct result of the lack of quantitative information. In addition, managers choose what type of information they wish to disclose and have the power to stop disclosing information (Depoers and Jeanjean, 2010). On average 80% of a 10-K report is devoted to the narrative textual component of financial disclosures (Li, 2010). This qualitative information is vital to understanding firms' past results, future outlooks, and most importantly the current performance (Clarkson, Kao and Richardson, 1994).

A way to measure if the quantitative data included in a report matches or is somehow associated with the qualitative information is through content-analysis. This was investigated by Abrahamson and Amir (1996) using the Chairman Letter or as it referred in their study the "President Letter". Content-anaysis is a process that divides into various groups or categories, the content of any piece of information by codifying (Weber, 1988). Following this method, Abrahamson and Amir (1996), conducted a study that measured the amount of negativity expressed in the Chairman Letter or "President Letter" by the firm's management. They found this to be negatively correlated with the accounting-based performance. These results demonstrate the importance of this part of the

annual report and its usefulness in predicting the future performance of any firm (Abrahamson and Amir, 1996). Although firms produce quantitative earnings forecasts, it's been suggested that a majority of companies choose not to issue such forecasts.

Thus, it comes as an important aspect to study the importance of financial narratives and the dangers they may bring, such as manipulation of results or information obfuscation.

2.2 Financial narratives

The need for financial narratives analysis comes from their importance within any firm's annual reports. An annual report includes the mandatory quantitative information, such as financial statements and the narrative component that includes the managerial opinion regarding the firm's financial position amongst other supplementary information such as the chairman letter, corporate social responsibility and main risks, etc (El-Haj, Alves, Rayson, Walker and Young, 2019). And since the annual report is one of the main tools used to communicate with the firm's stakeholders, the analysis of financial narratives is very important. Managers may choose to add a layer of complexity in narrative accounting disclosures to make information harder to extract (Bloomfield, 2002). This level of textual complexity is measured by readability, by analysing the degree of difficulty when reading a text (Smith and Taffler, 199). Li (2008) on the other hand understands readability as the size of the text.

The analysis of narrative accounting disclosures comes with the importance of clarifying whether more complex information is deliberately included by the firm's executives to change reader's perceptions. The success in the communication of any message is related to the level of readability of the narrative accounting disclosure (Smith and Taffler, 1992). A message that is not clearly communicated is not sufficient for decision-making (Souza, Rover and Borba, 2019). Effective reporting needs to include a clear and readable message, to meet the information needs of users (Shroeder and Gibson, 1990). Thus, readability comes as an important feature of the study of financial narratives. The analysis of narratives readability within annual reports dates back to 1952, by Pashlian and Crissy. Looking into readability with more detail, Smith and Taffler (1992) concluded that poor readability is directly associated with poor performance and easier readability is linked to financial success. Furthermore, the same authors in 2000 conducted another study that examined a relation between the content of the chairman statement and firm failure and found this to be closely associated with financial performance and argument reinforcement of unaudited disclosures containing important information.

Within the same topic of financial narratives it is also important to explore the level of disclosure of annual reports. The level of disclosure depends on each firm and the manager responsible (Depoers and Jeanjean, 2012). Managers may use voluntary disclosure to ease the informational problems associated with complex financial statements. Furthermore, managers trade off various disclosure mediums in an attempt to accomplish an optimal information environment (Guay, Samuels and Taylor, 2016). Firms that have more informative disclosure policies produce more accurate earnings forecasts and have less dispersion among individual forecasts and as a result less volatile forecast revisions (Lobo and Zhou, 2001). Furthermore, it has been found that information asymmetry

may be mitigated within firms that have more incentives to disclose more information (Lang and Lundholm, 1993).

The use of complex narrative disclosures may be understood as an information-based agency problem because managers can make use of complex narratives as means to gain personal benefit (Souza, Rissatti, Rover and Borba, 2019). The complexity of financial statements may influence investor's historical accounting reports, thus as a consequence increasing processing results (Drake, Roulstone and Thornock, 2016). Hence, the study of financial narratives comes as a useful tool to explore firms' financial performance, especially during times of financial instability.

2.3 Obfuscate the real performance of firms

The use of financial narratives and influence of perceptions comes with the need of obfuscating firm performance. This is one of the main dangers of complex financial narrative use. Managers may use intentionally complex language to increase information processing costs and to delay market reaction towards the news. This relationship is called the management obfuscation hypothesis. Throughout the years, the language in a firm's disclosures has become increasingly complex and this is an issue due to the increased processing costs for investors (Louhgran and Mcdonald, 2014). The management obfuscation hypothesis suggests that managers may be motivated to obfuscate information when firm performance is poor, since markets may react with delayed incorporation of the information in complex disclosures (Bloomfield, 2002). Furthermore, the production of complex annual reports may be an incentive for managers if positive earnings of the current year are temporary or if poor earnings are persistent (Li, 2008). Looking into another perspective, firms are more prone to disclose more information and lower information processing costs

(Li, 2008). The management obfuscation hypothesis foresees that firms with more complex annual reports have less recurrent profits throughout the fiscal year (Li, 2008). From the study conducted by Li (2008), this was found to be true and firms with poor performance produce more complex annual reports. Conversely, complex language may also reveal the provision of informative technical disclosure (Bushee, Gow and Taylor, 2018). The trend of complex narrative accounting disclosure is sponsored by managers that seek to increase their well-being or are trying to achieve a benchmark (Souza, Rover and Borba, 2019). Throughout the years the empirical literature has used readability as a proxy for obfuscation of narrative information. Such was the case with Lee (2012) that investigated whether complex quarterly reports expose the efficiency of the market. They found that the less readable content damages the market since it delays the firm's analysis of results. Kohut and Segars (1993), found that high-performance firms' annual reports were wordier in comparison to low-performance reports suggesting therefore that good news are reported with more elaboration whereas poor performers report with fewer words. Likewise, it was found that the mean readability index levels were significantly lower when good news was reported than when bad news. Thus, the good news was transmitted with short simple sentences while bad news was given in long and complex sentences (Subramanian, Isley and Blackwell, 1993). When studying the management obfuscation hypothesis it is also important to mention impression management. Impression management is the tendency for individuals such as managers and organizations to use data in a strategic way such that they look with a positive tone (Clatworthy and Jones, 2006). Impression management is coherent with the obfuscation hypothesis since managers obfuscate failures and highlight success (Courtis, 1998). Within the disclosure strategies in corporate narratives, many studies have been conducted looking into different theories, such as agency, (Abrahamson and Amir, 1996), signalling, (Smith and Taffler,

1992) or stakeholder, (Hooghemstra, 2000), as theoretical fundamentals of the obfuscation hypothesis (Patelli and Pedrini, 2014). These theories look to predict that managers will engage in impression management by deliberately manipulating discretionary disclosure as means of announcing a positive performance assessment (Patelli and Pedrini, 2014). Furthermore, it´s been found that obfuscation of performance results may be accomplished through different cover-up strategies, that manipulate ease of reading, tone, content, performance metrics and visuals (Merkl-Davies and Brennan, 2007).

2.4 Chairman letter

This research will be focused on the chairman's letter, which is included in every firm's annual report. The annual report is one of the main communication tools used between corporate management and the various interested parties. The use of narratives disclosures is a known contemporary annual reporting trend, that is practiced by managers as means of communication. (Courtis, 1997). The annual reports are extensive and many studies have been conducted as a means of analysing financial narratives in the whole report. The first item of any annual standard report is the chairman's letter. The chairman letter is a widely known item of any firm's annual report, and it's practically universal. The main objective of the chairman's letter is to present an initial view of the firm's activities and performance during the year. In addition, within many firms, this chairman letter is generally unaudited, however, in the United Kingdom, the letter is checked by auditors to confirm that information included in the letter is consistent with the financial statements (Clatworthy and Jones, 2006). Moreover, the chairman letter was found to be a useful tool to infer about the firms' quality of earnings. This is a document that is less restricted by the Securities and Exchange Commission (SEC) and within the SEC regulations, there are no

specific requirements as to what should be included in this part of the annual report (Abrahamson and Amir, 1996).

Firms that perform better have annual reports that are easier to read and understand whilst firms that performed worse financially have more complex annual reports (Subramanian, Insley and Blackwell 1993). Likewise, it was found that lower ROE (Return on equity) firms make more prominent use of future references and convey a more forward-looking image, compared to higher ROE firms. There is a higher emphasis on future performance. Higher ROE firms also tend to use more verbose than lower ROE, suggesting that "good news" is reported with more elaboration (Kohut and Segars, 1992). Following all of the studies conducted, this analysis will focus on the use of complex narratives within chairman letters.

2.5 Research Question: Is the use of complex financial narratives related to firm performance ?

There is an ongoing debate if indeed the use of financial complex narratives is related to financial performance (Souza, Rover and Borba, 2019). As it was mentioned before, annual reports have the power to somehow predict the performance of any firm. Annual reports are powerful tools, used by firms to communicate with their shareholders, investors and report to the market (El-Haj, Rayson, Alves and Herrero-Zorita and Young, 2017). From the study conducted by Li (2008), the evidence found suggests a clear correlation between the linguistic features of annual reports and firm performance. Managers may have incentives to produce such complex financial reports, in order to hide poor performance or personal well-gain such as end-year bonuses. Thus, it comes as an important aspect of this investigation to check if the information in the

chairman's letter is consistent with the reported financial information (Abrahmson and Amir, 1996).

The goal of this research is to explore if indeed managers use more complex financial narratives in chairman letter in order to disguise financial performance. This relationship will be studied by evaluating the readability level of each firm's chairman letter and then evaluating if the financial performance is affected by this. The characteristics of the chairman letter of both profitable and unprofitable firms will be evaluated and studied. At the end of this research we will prove if this relationship exists and in what circumstances.

To test if the chairman letters are similar in length of profitable and unprofitable firms, the following hypothesis was formulated.

H1: *The length of the chairman letter is not related to the existence of profits or losses.*

As it was mentioned before, firms with positive results will use more verbose in the chairman letter to further explain the firm´s efforts to achieve these results. As opposed to when firms with a worse performance that prefer to explain the less positive results more succinctly (Kohut and Segars, 1992).

H2: *There are no textual differences between the median or mean readability level of profitable and unprofitable firms.*

Readability is about measuring how difficult it is to read and understand any text (Souza, Rover and Borba, 2019). It's been suggested that there are some differences in textual complexity of the chairman letter of high performance and lower performance firms (Hrasky, Mason and Wills, 2009). Therefore, this hypothesis was developed with the intent of finding if there are indeed median or mean textual differences in the chairman letter, between profitable and unprofitable firms. Readability is measured using three proxies: Fog, Flesch and Length.

H3a*: The chairman's letter of firms will focus equally on the future, during periods of economic boom.*

H3b*: The chairman's letter of firms will focus equally on the future, during periods of economic recession.*

This hypothesis was formulated with the intent of studying the number the future references each chairman letter includes, during periods of Economic Boom and periods of Economic Recession. Clatworthy and Jones (2006), suggested that discussing the future is a method used by managers to divert the attention from a less positive performance. Thus, it may be expected that profitable firms will focus more on current results than on future results whereas, unprofitable firms will focus more on the future.

H4: *There is a negative relationship between the chairman letter complexity and firm performance.*

To conclude, the last hypothesis was formulated with the intent of answering the main research question. This will be addressed by analysing the complexity of the financial narratives through a readability formula with the performance of each firm. Both profitable and unprofitable firms will be analysed. The readability formula will allow the researcher to find the level of education one needs to have to understand the document (Subramanian, Insley and Blackwell, 1993). Courtis (1986) suggested that readability levels of annual reports were related to writing skills or corporate policy of firms. This research intends to establish a link between the writing skills of each chairman letter and the performance of firms. With this hypothesis we are able to assess if indeed firms manipulate information.

3. Methodology

3.1 Sample selection

The textual features of the chairman letters used for this analysis were extracted and processed using the CIF-FRSE software (El-Haj, Rayson, Alves and Herrero-Zorita and Young, 2017). Thus creating a dataset of analysis.

We excluded observations classified as having extraction problems (D_AR_IGNORE=1), observations with no valid total assets or market value (D_TA_MV=0) and firms without long -term debt. Finally, we also excluded financial firms (D_Financial=1).

On the other hand, with the presence of outliers, the extreme top and bottom one percentile were dropped for all variables. The sample for this research comprises 1,665 firms from 9 different industries, between the years of 2006 until 2020 (Table 1).

Table 1 – Sample selection

Sample Selection	Main Sample
All firms processed by the software CFIE - FRSE	25897
Less: Firm's annual reports with questionable accuracy	1338
Less: Firms without Long-term debt	1846
Less: Companies belonging to the financial sector	8891
Less: Companies without total assets and market value	337
Less: companies considered outliers (1% and 99% percentile)	2608
Total Sample	**10877**

3.2 Research design

In order to test the hypothesis and the relationships in-between the variables, several OLS regressions were executed. These OLS regressions were formulated with the intent of answering the research question. To understand the impact of the complex financial narratives within the chairman letter, we regressed three readability variables onto firm performance, control variables, industry-fixed effects and year fixed-effects following the study conducted by Li (2008). Furthermore, we also regressed a forward-looking variable onto firm performance and control variables, during periods of economic boom and periods of economic recession, to assess the way firms elaborate the chairman letters during period of crisis regarding the use of forward-looking statements.

The hypotheses were tested using the following regressions:

$$\begin{aligned} \textit{Complex Financial Narratives}_{it} &= \beta_0 + \beta_1 \mathrm{EPS}_{it} + \beta_2 ROA_{it} + \beta_3 Lev_{it} + \beta_4 ROE_{it} \\ &+ \beta_5 \mathrm{Size}_{it} + \beta_6 \mathrm{BusSeg}_{it} + \beta_7 \mathrm{Returns}_{it} + \beta_8 \mathrm{Prices}_{it} \\ &+ \beta_9 \mathrm{EconCrsisis}_{it} + \beta_{10} \mathrm{FowardLooking}_{it} + year\ fixed\ effects \\ &+ industry\ fixed\ effects + \varepsilon_{it} \end{aligned}$$

Three statistics were used to measure the use of complex financial narratives within the chairman letter. The first dependent variable for model (1) used was the Fog Index, of the Chairman letter from the annual report published by firm i, in year t. This variable has its origin from computational linguistics literature and it's a measure of complex financial narratives. This was developed by Robert Gunning and it's calculated as follows (Li, 2008): Fog = (Words_per_sentence + percent_of_complex_words) * 0.4. Complex words are considered to have three

or more syllables. If Fog ≥ 18, then the text is unreadable, 14-18 (difficult); 12-14 (ideal); 10-12 (acceptable); and 8-10 (childish).

The second model (2) used the Flesch Formula as dependent variable, taken from the Chairman letter from the annual report published by firm i, in year t. This captures the use of complex financial narratives. This is a simple and straightforward formula to use that includes sentence, length and syllables per 100 words: Flesch = (Number_of_syllables_per_100_words – average_length sentence _length). The closer the score is to 0, the more difficult it is to read the text (Courtis, 1995).

The third model (3) used is the length of the document taken from the Chairman letter from the annual report published by firm i, in year t, as a dependent variable. This variable was used following the study conducted by Li (2008), that found longer documents are harder to read and information-processing costs of longer documents are higher. It was suggested that strategic managers, may use the length of the annual report as a way to make annual reports less transparent and to hide information from stakeholders (Li, 2008). The length of the chairman letter was defined as follows: Length = Log (WordCount). The natural logarithm was used because of the skewness in the word count across firms and some extreme values (Li, 2008).

The independent variables used for this regression, were proxies of firm performance, that controlled for operational risk, following the study conducted by Souza, Rover and Borba, (2019). This included Earnings per share (EPS_{it}) from firm i, in year t and Return on assets (ROA_{it}) from firm i, in year t.

Furthermore, a series of control variables were added following the study conducted by Li (2008) to avoid biased results. These are considered non-strategic components. This included: Leverage (Lev_{it}) from firm i, in year t. Firms with high levels of debt may have to resort to persuasion techniques to have investors pour more money into projects by disclosing more complex

information (Souza, Rover and Borba, 2019). Return on equity (ROE_{it}) from firm i in year t. This controls for financial performance. It was found that consistent with the obfuscation hypothesis, readability of the chairman's statement is positively related to firm performance (Smith, Jamil, Johari and Ahmad, 2006).

Size (Size_{it}) of firm i, in year t. This was calculated as the natural logarithm of Market Value. It was suggested that firm size may impact the financial statements by making these more complex (Souza, Rover and Borba, 2019). Furthermore, this variable captures a firm's operational and business environment. Number of Business Segments (BusSeg_{it}) is the log (1+number of business segments) of firm i in year t. Firms with more complex operations and with a large number of business segments may produce more complex annual reports. This complexity was captured with this variable. Returns (Returns_{it}) that refers to the 12-month stock returns from firm i, in year t. Prices (Prices_{it}) is the stock price from firm i, in year t.

A dummy variable named economic crisis (EconCrsisis_{it}) was used to identify the year of economic crisis (2008 and 2009), whenever it takes the value of 1. It was found that companies issue more forward-looking performance disclosures when increasing debt or delivering bad news in financial statements. Furthermore with the presence of managerial bonuses, investors rely on forward-looking performance disclosures with the quality of earnings reports in audited financial statements (Athanasakou and Hussainey, 2014). Moreover the variable forward-looking ($\text{Forward Looking}_{it}$), refers to the number of future references mentioned within the chairman letter. To conclude, industry and year fixed effects was added as potential determinants of the readability, following the study conducted by Li(2008).

As it was mentioned before a second regression was formulated with the intent of answering hypothesis 3a and 3b, assessing therefore the use of forward looking references within the chairman letters. This assessment was done during

periods of economic recession and periods of economic boom. Thus, the following regression was formulated:

$$\textit{Forward Looking Statements}_{it} = \beta_0 + \beta_1 \text{EPS}_{it} + \beta_2 ROA_{it} + \beta_3 Lev_{it} + \beta_4 ROE_{it} + \beta_5 \text{Size}_{it} + \beta_6 \text{BusSeg}_{it} + \beta_7 \text{Returns}_{it} + \beta_8 \text{Prices}_{it} + \beta_9 \text{EconCrsisis}_{it} + \textit{industry fixed effects} + \varepsilon_{it}$$

This model regressed forward looking statements onto firm performance and control variables. Within this fourth model (4) the forward looking variable was taken from the Chairman letter of the annual report published by firm i, in year t, as a dependent variable. This is the number of future references mentioned in the chairman letter. It allows the reader to get a perspective of the firm's future.

Thus this regression was done with the intent of exploring if during periods of financial struggle, firms make a more prominent use of forward looking statements to position the reader towards the future and to explain the weak financial performance of firm i. During the years of 2008 and 2009 the world experienced an economic crisis, thus this relationship is being studied during periods of economic boom and economic recession. Within this model the same independent variables were used as before: Earnings per share (EPS_{it}) and Return on assets (ROA_{it}). In addition, the same control variables were also used as before: Leverage (Lev_{it}), Return on Equity (ROE_{it}), Size (Size_{it}), Number of Business Segments (BusSeg_{it}), Returns (Returns_{it}), Prices (Prices_{it}) and Dummy of Economic crisis (EconCrsisis_{it}). Except the forward looking variable that is being used as a dependent variable.

4. Results

Table 2 presents the descriptive statistics of the whole sample of non-financial firms.

The median firm works within 2 business segments and includes 15 forward-looking words in its chairman letter; the median price is 0.96, whilst the median market value is 48. Furthermore, the median firm has a 6% of return on equity and 2% of leverage. On the other hand, the median firm has 3% of earnings per share and 3% of return on assets.

In addition, the median firm has a word count of 901 within its chairman letter indicating at a first sight that the median firm has a wordy letter; a Flesch median reading of complex financial narratives of 47.34; and a median Fog Index of 19.76, meaning that the median firm has an unreadable chairman letter.

Within the following sections the results are presented as follows: Table 3 presents the results of models 1,2 and 3 regarding the use of complex financial narratives. While table 4 presents models 4 and 5 with the different textual characteristics of the use of complex financial narratives between profitable and unprofitable firms. And finally table 5 shows model 6 concerning the use of forward-looking words during periods of economic recession and economic boom.

Table 2 – Descriptive statistics

Panel A - Dependent Variables								
Variable Name	**N**	**Mean**	**St. Dev**	**Min**	**P25**	**Median**	**P75**	**Max**
Word Count	10,877	1,019	545.20	153	631	901	1,276	3,922
Flesch	10,877	46.76	9.85	-94.53	41.49	47.34	53	71.16
Fog	10,877	19.94	2.33	14.19	18.44	19.76	21.23	37.44
Panel B - Independent Variables								
EPS_FYE	10,877	0.17	0.71	-10	0.02	0.03	0.16	2.72
ROA	10,877	-0.07	0.34	-3.47	-0.08	0.03	0.07	0.32
Panel C - Control Variables								
LEV	10,877	2.13	9.39	-51.49	-0.01	0.02	3.29	74.44
ROE	10,877	-0.09	0.82	-8.70	-0.134	0.06	0.16	4.13
Numb. of Bus. Seg.	10,877	2.37	1.54	1	1	2	3	7
Returns	10,877	0.06	0.53	-0.90	-0.30	0	0.30	2
Mark. Value at FYE	10,877	668.79	2136.50	0.18	10.92	48	321.85	25,516
Forward Looking	10,877	17.41	10.80	0	10	15	22	67
Prices at FYE	10,877	2.80	5.25	0	0.26	0.96	3	63.92
D. Econ. Crisis	10,877	0.16	0.37	0	0	0	0	1

4.1 Complexity of the chairman letter

Table 3 presents the regression models on the three complex financial narratives variables that includes, Fog (Model 1), Flesch (Model 2) and Length (Model 3), from the chairman letter of each firm. This table tests H1 and H4.

Table 3 – OLS estimates of the financial complex narratives

	Financial Complex Narratives					
	Fog		Flesch		Length	
	Model 1		Model 2		Model 3	
Earnings p/ share	−0.1097	***	0.1655		0.0027	
	(0.0002)		(0.1118)		(0.6161)	
Roa	−0.6090	***	2.172	***	0.0038	
	(0.0000)		(0.0000)		(0.7794)	
Leverage	−0.0063	***	0.031	***	0.0001	
	(0.0037)		(0.0003)		(0.7137)	
Roe	0.0024		0.1379		−0.0064	
	(0.9402)		(0.3232)		(0.1856)	
Forward Looking	−0.0028		0.020	**	0.0364	***
	(0.1621)		(0.0180)		(0.0000)	
Size	0.0070		−0.2580	***	0.0172	***
	(0.5697)		(0.0000)		(0.0000)	
BusSeg	0.0360		−0.3387		0.054	***
	(0.5207)		(0.1404)		(0.0000)	
Returns	−0.0196		−0.2043		−0.0062	
	(0.6513)		(0.2834)		(0.3571)	
Prices	−0.0049		0.0167		0.0029	***
	(0.2532)		(0.3274)		(0.0000)	
EconCrisis	0.2090	*	−0.7783	*	0.0042	
	(0.0586)		(0.0850)		(0.7947)	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
F Statistic	17.14389		23.16303		400.4951	
Adjusted R2	4.387%		5.70%		59.46%	
N	10877		10877		10877	

P-values reported in parentheses are computed using the robust standard errors to obtain unbiased OLS coefficients estimates and it's *p-values < 0.1; **p-vales <0.05; ***p-values <0.01.

Within model 3, length (Log of Word Count) was regressed onto the independent variables and control variables. Following this regression, it may be concluded that hypothesis H1 cannot be accepted, due to the fact that all coefficients have a significance level above 5%. Nothing can be inferred regarding the length of the chairman letter and its relation to profit or losses because the regression does not allow us to make any conclusion. Whilst length cannot explain this relationship, it can be concluded that there is indeed a positive relationship between the variables, however not a significant one. The results from this regression do not support the results of the study conducted by Li (2008) that found that length is negatively correlated with earnings, within other sections of the annual reports. One possible explanation for this is that managers may tend to elaborate on positive financial performance in the chairman letter, however, they may prefer to communicate poor financial performance more succinctly (Clatworthy and Jones,2006).

Within model 1 hypothesis H4 is accepted. By looking at the significance level of the independent variables that are both below 5%, there is indeed an existent negative relationship between firm performance and the complexity of the chairman letter. This regression suggests that as firm performance decreases the complexity of the chairman letter increases. The firm performance was measured by the variables Earnings per share and Roa that are both negative and statistically significant (Eps, coef. -0.109, $p < 0.05$ and Roa -0.609, $p < 0.05$). These findings support the study conducted by Souza, Rover and Borba, (2019). Furthermore, these findings back the management obfuscation hypothesis in the study conducted by Bloomfield (2002), that firm performance variables are negatively related to the use of complex financial narratives. On the other hand, model 2 rejects hypothesis H4. This found that there is a positive relationship between firm performance and complexity of the chairman letter, leading to the

conclusion that as the firm performance increases the complexity of the chairman letter also increases.

Regarding the control variables, the measure of indebtedness, is positive and statistically significant within model 2 (Lev, coef. 0.031, $p < 0.05$). This suggests that more levered firms, provide more complex information as means to make investors pour more investments into their firm (Ajina, Laouiti and Msolli, 2016). Moreover, the forward-looking variable was also found to be positive and statistically significant, within both models 2 and 3 (Forward-Looking, coef. 0.020, $p < 0.05$). Suggesting, therefore that as the number of complex financial narratives increases, so does the use of forward-looking words. Managers may attempt to strategically divert the reader towards a better future, alongside the use of complex financial narratives within the chairman letter. The price variable resulted in a positive and statistically significant within model 3 (Prices, coef. 0.029, $p < 0.05$), which suggests that firms with a high share price, may disclose less information and provide a more complex chairman letter. Furthermore, within model 3 the variable of the business segments resulted in a positive and significant variable (BusSeg, coef. 0.054, $p < 0.05$). This suggests that firms that operate within several business segments and have a complex business environment, tend to develop a more complex chairman letter. This contradicts Li (2008) results because the study conducted yielded the opposite results, although this was predicted by the same author. Firm size was also found to be statistically significant (Size, coef. 0.0172, $p < 0.05$), meaning that larger firms are more prone to include more complex narratives within their chairman letter, due to the complexity of their operating and financial activities. This finding supports the research conducted by Li (2008) and Souza, Rover and Borba, (2019).

Overall, we cannot conclude anything regarding the length of the chairman letter except for the existence of a positive relationship between length and the proxies of firm performance. However, a negative relationship was found between the use of complex financial narratives, which was measured with the Fog Index, and firm performance, allowing us to accept hypothesis 4. Hence, there is indeed a negative and significant relationship between the use of complex financial narratives and firm performance. Managers have indeed incentives to make prominent use of complex financial narratives whenever firm performance declines.

4.2 Complexity of the chairman letter

Table 4 presents the descriptive statistics divided between profitable firms and unprofitable firms. Profitable firms were considered to have EPS > 0 whereas unprofitable < 0. These were considered following the study conducted by Subramanian, Insley and Blackwell (1993). This part answers hypothesis 2.

Table 4 – Descriptive statistics for complex financial narratives divided by profitable and unprofitable firms

	Profitable Firms			**Unprofitable Firms**			**Both Profitable and Unprofitable**	
	Model 4			**Model 5**				
Variable Name	**N**	**Median**	**Mean**	**N**	**Median**	**Mean**	**Median Wilcoxon P-value**	**Mean T-test P-value**
Word Count	6654	927.50	1037.50	4223	863	990.60	0.000 ***	0.000 ***
Flesch	6654	47.86	47.54	4223	46.23	45.53	0.000 ***	0.000 ***
Fog	6654	19.60	19.69	4223	20.09	20.31	0.000 ***	0.000 ***

P-values of a two-tailed t-test. *** Significance level is below 5%.

Following these results it may be concluded that hypothesis 2 is rejected, meaning therefore that there are indeed textual differences of complexity between profitable and unprofitable firms. Within profitable firms the median firm resulted in a median word count of 927.5, suggesting therefore that profitable firms like to elaborate on their positive results, as opposed to unprofitable firms that resulted in a median word count value of 863. The same effect was found with the differences in the mean value between profitable and unprofitable firms (1037.50 vs 990.60).

In addition, the Flesch Formula was another variable used as a proxy variable for the use of complex financial narratives. As suggested by the results there is a slight difference between the median value of the Flesch Formula variable of profitable and unprofitable firms (47.86 and 46.23). Thus within this variable, the textual differences are very small. Moreover, the Flesch Formula value for both profitable and unprofitable firms indicates that the chairman letter of these firms does not include a high number of complex financial narratives, hence the textual complexity is not high. There is a bigger difference with the mean value of the Flesch Formula, where it may be seen that profitable firms have a higher mean value of textual complexity

To conclude, within the last variable used to measure the use of complex financial narratives within the chairman letter, the median Fog variable, indicates a small difference in textual complexity. On the other hand, these results show that unprofitable firms include a higher number of complex financial narratives (20.09), to hide their negative performance as opposed to profitable that resulted in a slightly lower median value (19.60). Furthermore, the mean value of Fog Index, indicates that unprofitable firms, on average have a more complex chairman letter.

Overall it may be concluded that hypothesis 2 is rejected and there are textual differences between profitable and unprofitable firms. Furthermore, both the t-test and the Wilcoxon test were performed to assess the differences between the different means and medians. As indicated the p-value is below 5%, meaning therefore that there are indeed different textual characteristics between all three means and medians. There is clear evidence that there are textual differences between both profitable and unprofitable firms.

4.3 Forward-looking words during periods of economic boom and economic recession

Table 5 presents the regression model on the forward looking variable. A dummy variable was introduced to identify periods of economic crisis or periods of economic boom. This tests hypothesis 3a and 3b.

Table 5 - OLS regressions on forward looking words (periods of economic boom and economic recession)

Forward Looking Words		
Model 6		
Earnings p/ share	0.0988	
	(0.4418)	
Roa	0.7615	**
	(0.0350)	
Leverage	−0.0132	
	(0.2265)	
Roe	−0.1681	
	(0.2542)	
Size	0.36206	***
	(0.000)	
BusSeg	0.51871	*
	(0.0516)	
Returns	−0.0906	
	(0.665)	
Prices	−0.08646	***
	(0.0002)	
EconCrisis	−0.7908	***
	(0.0040)	
Industry Fixed Effects	Yes	
F Statistic	21.674	
Adjusted R2	3.16%	
N	10877	

P-values reported in parentheses are computed using the robust standard errors to o btain unbiased OLS coefficients estimates and it's *p-values < 0.1; **p-vales <0.05; *** p-values <0.01.

Within model 6 the forward-looking variable was regressed onto the independent and control variables. Following this regression, the dummy variable identifying the years of economic crisis resulted in a negative and significant relationship.

Thus during periods of economic crisis, there is a negative impact on the use of forward-looking words within the chairman letter. The expected number of forward-looking words in chairman letters during periods of economic crisis is 13.205. Firms do not focus on the future during periods of financial struggle within their chairman letter. This may be because of the uncertainty of the economic context. During years of economic crisis, the number of forward-looking words decreases. From this analysis during periods of economic boom, they make more prominent use of forward-looking words, whereas during periods of economic crisis they use less forward-looking words within their chairman letter. Thus, hypothesis 3b is rejected, and hypothesis 3a is accepted. These results did not corroborate our expectations.

Furthermore, as it may be seen in the regression the variable Roa resulted in a positive and significant relationship (0.7615, p-value < 0.05), meaning therefore that as firm performance increases, managers like to divert the reader onto the future. Furthermore, size also resulted in a statistical and positive result (coef. 0.3621, p < value 0.05) and the number of business segments (coef. 0.5188, p < value 0.05) indicating that as the size of a firm increases and business complexity so does the number of forwarding looking words within the chairman letter. One possible explanation for this may be that within larger firms there is a greater need to focus on the future, due to the fact that investors are constantly expecting better results. The other variables did not bear any statistical significance.

Overall, with the negative economic crisis variable, it can only be concluded, that the economic crisis, did not lead to the prominent use of forward-looking within the chairman letter. Managers may wish to discuss the future during

periods of economic boom, for investors to expect an even better future and to pour more investment in the company for future projects.

4.4. Further analysis

To avoid the possibility of the three dependent variables (Fog, Flesch and Length) presenting explanatory characteristics, these three variables were regressed against the proxies of financial performance (EPS).

This resulted in the following regression equation:

$$\begin{aligned} \textit{Earnings per share (EPS)} = {} & \beta_0 + \beta_1 \mathrm{Fog}_{itc} + \beta_2 Flesch_{itc} + \beta_3 Length_{itc} + \beta_4 ROA_{itc} \\ & + \beta_5 Lev_{itc} + \beta_6 ROE_{itc} + \beta_7 Forward\ Looking_{itc} \\ & + \beta_8 \mathrm{Size}_{itc} + \beta_9 \mathrm{BusSeg}_{itc} + \beta_{10} \mathrm{Returns}_{itc} + \beta_{11} \mathrm{Prices}_{itc} \\ & + \beta_{12} \mathrm{EconCrsisis}_{itc} + year + industry - fixed\ effects + \varepsilon_{itc} \end{aligned}$$

These three regressions were done with the intent of understanding if indeed the market recognizes the use of complex financial narratives. This was done with the Earnings per share due to the fact that is our 1st independent variable. This also captures the market reaction, whereas the return on assets is an internal measure that can be calculated with a bias point of view. Thus faced with this possibility the EPS variable was chosen. Following the first models regressed, we expect the same or at least the same results as the first three regressions were done. These models seek to answer the research question with some significance and give more support to the hypothesis that indeed managers produce more complex chairman letters, by including financial complex narratives with the intent of disguising the real performance.

Table 6 - OLS regressions of EPS

	Firm Performance					
	EPS		EPS		EPS	
	Model 8		Model 9		Model 10	
Fog	−0.009313	***				
	(0.0003)					
Flesch			0.00079			
			(0.1144)			
Length					0.0109	
					(0.6167)	
Roa	0.38351	***	0.3878	***	0.3895	***
	(0.0000)		(0.0000)		(0.0000)	
Leverage	0.0031	***	0.0031709	***	0.00319	***
	(0.0000)		(0.0000)		(0.0000)	
Roe	0.0367	**	0.0366	**	0.0368	**
	(0.0172)		(0.0175)		(0.0171)	
Forward Looking	0.000255		0.0003		−0.0001142	
	(0.6107)		(0.5965)		(0.9009)	
Size	0.0579	***	0.05814	***	0.057752	
	(0.0000)		(0.0000)		(0.0000)	
BusSeg	−0.007587		−0.007661		−0.008513	
	(0.6209)		(0.6178)		(0.5840)	
Returns	0.08486	***	0.0853	***	0.0852	***
	(0.0000)		(0.0000)		(0.0000)	
Prices	−0.00478		−0.00475986		−0.00477	
	(0.3291)		(0.3321)		(0.3309)	
EconCrisis	−0.07021	*	−0.07161	*	−0.0722771	*
	(0.0786)		(0.0734)		(0.0706)	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
F Statistic	35.07608		35.33746		35.15735	
Adjusted R2	13.681%		13.604%		13.411%	
N	10877		10877		10877	

P-values reported in parentheses are computed using the robust standard errors to obtain unbiased OLS coefficients estimates and it's *p-values < 0.1; **p-vales <0.05; ***p-values <0.01.

Following these regressions, it can be seen once more that the use of complex financial narratives impacts the firm's current performance. Furthermore, these results corroborate the management obfuscation hypothesis. This leads to the incomplete revelation hypothesis, that the analysis of financial information is

expensive and a detailed analysis is only done if the benefits of the analysis are greater than the costs (Souza, Rover and Borba, 2019).

Moreover, within model 8 hypothesis 4 is once more accepted, with the negative relationship between the Fog Variable and the EPS variable (coef. -0.0093, p value < 0.05). This confirms with the previously shown results, thus when the firm performance increases towards a more positive result the use of complex financial narratives decreases, due to the fact managers in this sense don't need to disguise the positive performance and can communicate the results more straightforwardly. Meaning therefore that managers may explain a positive firm performance more succinctly.

On other hand, model 9 used Flesch as a proxy for the use of financial complex narratives and as before due to the lack of statistical significance, the EPS variable does not explain this relationship. Furthermore, model 10, used length as a proxy of the use of financial complex financial narratives, and as before due to the lack of statistical significance, the EPS does not explain this relationship. Thus, within these models, hypothesis H4 cannot be accepted.

The second proxy of financial performance (Roa) was positive and statistically significant in all models, suggesting that as EPS increase so does the return on assets. On the other hand, as these increase, the level of indebtedness also increases due to the need for more investment to support this positive performance. This is seen by the positive and statistically significant result of leverage in all three models. Moreover, the ROE variable resulted in the same positive relationship in all three models. Furthermore, the Econ Crisis dummy variable was positive and statistically significant, suggesting it's significant during periods of economic recession.

5. Conclusion

This study investigates the use of complex financial narratives within the chairman letter of English firms. This research includes both profitable and unprofitable firms. Three proxies for the use of complex financial narratives were used (Fog, Flesch and Length). The main relationship between firm performance and the use of complex financial narratives was only found with the Fog Variable. The direction of these results is significant within an English scenario, due to the fact that it was found that in the chairman letter, there is an increase in the use of complex financial narratives whenever the firm performance decreases. These results are consistent and add to the research of Li (2008), that also found that firms' annual reports that have lower earnings are much harder to read whereas firms with more positive earnings are far easier to read. Furthermore, these findings support the management obfuscation hypothesis, that firms that end the year with lower earnings, develop more complex reports. These findings are in line with the notion that firms may send more complex messages to the market whenever the financial performance is not satisfactory (Souza, Rover and Borba, 2019). Furthermore, these results suggest that the market considers at some level, that the language included in annual reports is a reliable source to infer about firm performance.

Managers use this mechanism frequently however the question remains: do management consciously or unconsciously adopt these communication strategies to convey information on firm performance? This was not possible to retrieve from this study however, we were able to establish a direct link between the use of complex financial narratives and firm performance. These findings have direct implications for the current state of the financial report, where auditors do not formally audit.

Instead, they only review the chairman statement, to confirm its consistency with the financial statements (Clatworthy and Jones 2006). This indicates the need for a more rigorous inspection of the annual reports, or at least the development of more straightforward guidelines, when producing the annual reports, however, specific guidelines for different parts of the annual report.

Furthermore, we also sought to compare the different textual characteristics between the chairman letters of both profitable and unprofitable firms. It was indeed found that when faced with a negative performance or a positive performance firms structure their chairman letters differently. Likewise, we also regressed the use of forward-looking words, through different economic contexts (Economic Boom and Economic Recession). A negative and statistical relationship was found during periods of economic recession and the use of forward-looking words, meaning that during periods of financial struggle managers do not make prominent use of forward-looking words in the chairman letter.

Likewise, this study has its limitations. First, the focus of this research was only on non-financial English firms and the use of the financial complex narratives within only one section of the annual report, the chairman letter. Moreover, the proxies for the use of financial complex narratives were only three (Fog Index, Flesch Formula and Length) and these have been widely used in numerous studies. Third, this research focused on the use of forward-looking words during a small period. Thus, for future research, a large sample needs to be used covering other cultures and languages. Furthermore, it would come as an important aspect to study this is in a longer period and studying this relationship, by covering other major financial crashes and the use of forward-looking words. To conclude, other parts of the annual reports should be studied and a comparison within the different parts of the annual report should be done,

to see if the use of complex financial narratives is present within all sections of the annual report. From these limitations, future research can be done, such as studying the tone and writing style of the annual report (pessimistic and optimistic), within different economic contexts. Furthermore, future research can also try to link the use of complex financial narratives and managerial bonuses or end-of-year compensation.

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Appendix

Variable Name	Definition
Fog Index	This is a proxy for use of complex financial narratives. Calculate as (words per sentence + % of complex words) x 0.4. Complex Words are those 3 or more syllables. Longer sentences and a higher proportion of complex words increase the Fog Index resulting in a lower readability.
Flesch Formula	The Flesch Formula is: Reading Ease= Number_of_syllables_per_100_words – average_length sentence _length). The prediction is that close a score is to 0, the more incomprehensible is the writing.
Length	Length is the natural logarithm of the word count within the chairman letters between the year of 2006 until 2020
Earnings per share	It's the result of the period (positive or negative) divided by the total number of shares of the firms.
Roa	It is the return on the asset calculated as the ratio for net income to total assets.
Leverage	It's the firm leverage measure calculated by the total debt of the firm scaled by the shareholder's equity.
Roe	It's the return on equity calculated as the net income divided by Total Equity Shareholders.
Forward Looking	Number of forward-looking words from an updated version of the list of words proposed by Hussainey, Schleicher and Walker (2003).
Size	Firm Size: Logarithm of Market Value at FYE.
BusSeg	The natural logarithm of the number of reported business segments: Log (1+ Number of Business segments).
Returns	12-month raw stock return.
Prices	Stock Prices price from firms, between the years of 2006 and 2020.
EconCrisis	Dummy Variable that takes the value of 1, if the chairman letter was written during a year of Economic Recession and 0 otherwise.
Performance Firms	Dummy Variable that takes the value of 1, if the firm has EPS>0 (Profitable) and 0 if EPS<0 (Unprofitable).