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Auditing Signals and Accounting Indicators as Predictors of Financial Distress

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Abstract

In this dissertation, research and analysis has been conducted for 25 public listed firms in Portugal, of different industries. One set out to analyze the impact that audit related features and linguistic characteristics associated with audit reports can have in predicting financial distress in firms. Hence, an extensive empirical study has been conducted for this 25 Portuguese listed companies between 2014 and 2024, by using accounting and audit related information. The strategies were focus on the role of auditing, usage of modality weak verbs in audit reports, Key Audit Matter disclosed, Emphasis of Matter Paragraphs, Big Four audit firms, industry, and distress classification. Considering the modelling approach, multivariate analysis was conducted for each of the hypotheses presented. The results have shown that audit reports can marginally improve distress prediction, that modality score is closely related with the engagement specifics and not directly to distress, in contrary to formal audit warnings, that there is a clear separation between linguistic tone and distress communication, and that some specific industries are grounded by nature on increased financial distress risk.

Keywords: Financial Distress; Audit Reports; Linguistic Uncertainty; Portugal; Altman Z-Score

Sinais de Auditoria e Indicadores Contabilísticos como Preditores de Dificuldade Financeira

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Sumário:

Nesta dissertação, foi conduzida uma investigação e análise sobre 25 empresas cotadas em Portugal, pertencentes a diferentes indústrias. O estudo teve como objetivo analisar o impacto de diferentes características relacionadas com auditoria e aspetos linguísticos associados aos relatórios de auditoria que podem ter impacto na previsão de dificuldades financeiras nas empresas. Assim, foi desenvolvido um estudo empírico abrangente para estas 25 empresas portuguesas cotadas no período entre 2014 e 2024, recorrendo a informação contabilística e de auditoria. A análise incidiu sobre os relatórios de auditoria, a utilização de verbos modais fracos nos relatórios de auditoria, as Questões Chave de Auditoria divulgados, os parágrafos de ênfase, a atuação das firmas de auditoria Big Four, a indústria e a classificação do nível de dificuldade financeira. Relativamente à abordagem metodológica, foram conduzidas análises multivariadas para cada uma das hipóteses formuladas. Os resultados mostram que os relatórios de auditoria podem melhorar marginalmente a previsão de dificuldades financeiras, que o índice de modalidade está fortemente relacionado com as especificidades do trabalho de auditoria e não diretamente com a dificuldade financeira das empresas, ao contrário dos avisos formais do auditor, em que existe uma clara separação entre o tom linguístico e a comunicação de risco financeiro, e que determinados setores apresentam, por natureza, um risco acrescido de dificuldade financeira.

Palavras-chave: Dificuldade Financeira; Relatórios de Auditoria; Incerteza Linguística; Portugal; Z-Score de Altman

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Preface

Primeiramente queria agradecer à minha família e namorada por todo o apoio que me têm dado ao longo deste percurso desafiante, mas também bastante recompensador, serviram como um pilar de segurança em todos os momentos.

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List of Abbreviations

KAM – Key Audit Matters

EoM – Emphasis of Matter

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1.Introduction

In recent decades, we have seen an increased complexity in regards to the actual business environment, this goes in response to the increased risk of corporate failure, because of increased competition, and the need of diversification from the industry peers, this has been the cause that put financial distress prediction at the forefront of both academic and professional research. The ability of firms, to anticipate financial distress situations is a true upper hand, since it helps investors to act proactively, in adopting corrective actions to financial distress risk. The traditional models in the literature have relied mostly on accounting-based variables, like profitability, leverage, and asset turnover. However, this information can be subject to discretion and misinterpretation by individuals, or even intentional misreporting. That is when audit reports came into play, external audit and auditing-related signals has become of the foremost importance in the current market decisions.

1.1 Research Problem

External auditing services can provide an independent and true view of the financial statements provided public by a company, it is the sole basis of trust in Finance, that investors and creditors can rely upon. Audit reports contain information that is relevant about risk factors, like, going-concern doubts, modified or qualified opinions, that can proceed formal financial distress in firms. Accordingly, combining this auditing indicators with accounting data can hold a potentially way of improving common prediction models in more grounded research of financial distress. This thesis is trying to seek and examine how auditing and accounting variables used together can enhance the prediction of financial distress in public companies.

By a using a rich data set of audited financial statements and audit reports disclosures, from top public companies in Portugal, from a range from 2014 to 2024, the empirical analysis aims to contribute to already common accepted literature on distress prediction and audit quality, by also offering a new way of offering practical insights to this research and professional individuals who monitor early-warning indicators of corporate distress situations.

Predicting financial distress has for a long time been a major and central topic in finance, accounting, and auditing research, since of its profound implication for firms, and the market. Early research models, made by notoriously researchers, such as the Beaver's univariate tests (1966) and Altman's Z-Score (1968) have showed that accounting ratios have a great value in regards of predicting failure in firms. Yet, after decades of work by deepening these researches, have also shown that the use of financial ratios alone is not sufficient to fully capture the complexity and environment of current companies, nor the qualitative signals that precede insolvency. As stated before, the financial reporting has become nowadays more complex, so it was necessary to create more enriched models that would be able to fully capture this complex environment, by using additional predictive variables, including qualitative and non-financial indicators.

A growing body of literature shows that audit reports and their attributes, are underexploited and that they can contain highly informative sources of early warnings of financial difficulties in a firm. These reports contain mostly qualitative information related to emphasis of matter

paragraphs, going concern warnings, or even comments on relevant fields of the company that can serve as a tool to discover deeper problems that cannot be visible by just looking into financial ratios and financial information alone. Muñoz-Izquierdo et al. (2019), have showed that audit reports are able to explain the causes of business failure. They used a matched sample of Spanish firms, where they concluded that audit reports disclosures explained business failure with a highly increased accuracy, by also reflecting both deterministic and voluntaristic causes of failure.

Complementary evidence comes from the research that examined whether audit characteristics enhances classic distress prediction models. Muñoz-Izquierdo et al. (2019), could show that by incorporating disclosures made by audit reports, would provide an improvement in the accuracy of the prediction models. This research was capable to proof that audit reports can provide enough explanatory and predictive power far way beyond of what it is possible to extract by just looking at the financial statements of the firms.

Furthermore, previous research has been made by exploring how audit characteristics such as audit firm size, industry expertise, tenure, and audit fees can correlate with the probability of firms defaulting. It was found that firms that were audited by large audit firms, like the Big Four, or even, industry experts were less likely to default, whereas large audit fees, that often, are charged higher, because of riskier clients, would be associated with an increased likelihood of failure.

Recent evidence in research has confirmed that these audit related factors are of foremost importance when assessing prediction models. Over the past two decades, the studies regarding going concern issues and their relation to financial distress has been increasing, by focusing on audit quality, in audit reporting, while also integrating governance related drivers of distress. This literature found that audit is one of the central drivers, that can influence how stakeholders view and interpret the financial statements of the companies and therefore, the financial health of the same.

Despite the advancements, that has been made in the field, there is still room for improvement to deepen the understanding on how the audit information and accounting data can jointly be able to predict financial distress, by also assessing, greater regulatory environment and audit transparency in the contemporary environment. As already stated, the combination of these key indicators provides strong predictive power, but many questions remain unasked.

The research was also focused on the linguistic tone and the contextual words used in audit reports, this, can help understand the risk and secureness that auditors have while emitting an opinion on the financial statements of the clients. An important theoretical basis comes from Flowerdew & Wan's (2010) genre analytical study of audit reports. It could show that they are shaped by linguistic conventions, it showed that audit reports have a stable and fixed template on how to present the main findings, other have showed a more flexible environment when producing an opinion, and that this linguistic variation and flexibility is appeared with more relevance in context of more irregularities or even when a qualified opinion is issued. The analysis made by Chiosea & Hategan (2024), demonstrated that there is an increased market growth regarding the research linking going concern paragraphs and their connection to early signs of distress, it was found that audit language has an intrinsic importance in the market perception of investors. Seebeck & Kaya (2023) have examined the communicative value of audit reports under the ISA 701 regime, where it was discovered that it was made clear

improvements in the readability and specificity focuses, after the implementation of Key Audit Matters (KAM) in audit disclosures.

The thesis focus is to address the gaps in the main researches, by interplaying audit information, by focusing on the content and characteristics of audit firms, accounting data, and financial data to enhance and improve the financial distress prediction models already known and stated. Building from the insights of the papers stated above, it is going to be tested whether these combinations can create predictive power, by evaluating whether different categories of disclosures can influence distress predictions, and conclude whether the client-audit relationship and characteristics can signal risk evidence beyond what financial statements can provide.

2.Literature Review

2.1 Financial Distress and traditional prediction models

The basis of research made by Beaver (1966) and Altman (1968), was the starting point of the further research on corporate financial difficulties. These studies have found that the financial ratios that were calculated directly from financial ratios in the financial statements have significant explanatory power, regarding the probability of default that these companies may face, that can be translated into business collapse and failure. Building from this, subsequent analysis has been made by integrating accounting information into the regression models, and, integrating it into more advanced statistical and machine learning algorithms, such as the logit and probit models, hazard, and neural networks, as well as by increasing the time horizon of the studies.

Bellovary et al. (2007), Balcaen and Ooghe (2006), and Kumar and Ravi (2007) carried out an in-depth full examination that summed up several years of research, that shows that ratio-based models have become less reliable and decreased their predictive power over time, in reaction to increased complex environment of recent market. The pure accounting-based indicators have also become less trustworthy, because more managerial discretion is being used in financial statements.

Notwithstanding these conclusions, the Altman Z-Score and its subsequent variations, is still the primary and foundation model used in the identification and forecasting of distress, it is still the main benchmark in both academic and professional research. The Z-Scores still provides a quality stamp in this research, it was first created solely for manufacturing firms, and then it suffered modification for non-manufacturing firms, and even for privately held companies. Altman et al. (2017) is still significant worldwide, since it has displayed that its performance is still competitive, even more, when it is updated to current data and worldwide market environment.

Furthermore, an increased amount of research has been showing that financial ratios alone are not able to predict fully financial distress, therefore, with the view to improve the accuracy of the models, recent research supports the inclusion of additional explanatory variables, such as

market-based indicators, and other non-financial information. This development is the main indicator of this larger trend of combining financial and non-financial indicators of firms.

2.2 Non-financial information and the role of auditing

By introducing additional variables in prediction models, that can acknowledge that financial ratios alone are not able to fully capture the complexity that is present behind business distress, is a significant development made in the research. As shown by Keasey and Watson (1991), firm specific features regarding, age, industry, ownership structure and management characteristics, are a clear provider to the increasing explanatory power of the research.

Furthermore, the audit company plays also an important role in guaranteeing the accuracy and the completeness of financial statements disclosed by firms, the auditor's work is of foremost importance for the trust it provides to the financial markets and its participants. Audit reports are a useful non-financial predictor of distress, since it contains quantitative based on the opinion provided, as well as qualitative information like the emphasis of matter paragraphs. The evidence of Mutchler (1985), shows that firms that received a going-concern issue or a qualified opinion were more likely to face risk of failure in some cases, even though the auditors do not always issue such warnings in time to prevent misclassification, this research, supports the importance of using audit related inputs to the financial distress literature.

Financial distress models have been using audit variables in more recent empirical studies, cases of Altman, Sabato, and Wilson (2010), that have revealed that the accuracy of SME default prediction is increased when included in the model, non-financial variables, regarding, audit opinion type, going concern issued and auditor firm changes. In a similar way, Altman et al. (2017), showed in their global re-examination of the Altman Z-Score that the factors regarding auditor size, industry and country are indicators of foremost importance in revealing significant information besides what financial ratios alone can provide.

Despite the advancements made, most of the previous research has treated audit variables in a very simplistic form, by resuming the qualitative information into one or two dummy variables, hiding the effect of the linguistic tone in audit reports. The complexity in audit reports, that frequently can reveal financial and operational issues can be ignores if these indicators are looked upon in a very simplistic way. Narrative sections of the reports can offer golden information that increases the predictive power of the models, and that can be able also to anticipate business decline, according to studies made by Carcello and Neal (2000), and by more contemporary textual approached such as the work made by Küster, Steindl and Götsche (2025).

Audit reports need to be seen as more than just papers for regulatory compliance, since they serve as informational signals, that can reveal underlying risks and vulnerabilities that are not fully presented into the financial statements. Therefore, it exists, a promising field, to improve the explanatory and predictive power of financial distress by using models that are able to incorporate audit information, such as being audited by a Big Four audit company or not, audit tenure, and switching audit companies, as well as previously stated, the narrative content, when stating emphasis-of-matter paragraphs or Key Audit Matters.

2.3 Audit reports, going-concern and causes of business failure

The principal literature on financial distress and auditing has been focused on the interplay between audit reports and business distress, the utility of going concern comments as signals of early warnings of failure approaching in a firm, is the focus of these researchers. Furthermore, Geiger and Raghunandan (2002), showed that firms facing severe financial concerns are more likely to receive a going concern issue in their audit reports in the period preceding bankruptcy, the results, clearly state that the work made by auditors does contain relevant information in the prediction of distress and the detection of risk.

The predictive power of the going concern opinions are yet far from perfect, since several studies showed substantial misclassification, whereby a significant number of firms fail shortly after receiving an unqualified opinion by their auditors, raising concerns, about delayed or insufficient warnings signals. This mixed evidence of work has increased the debate on this topic, regarding auditor conservatism, attached to reporting incentives, and even, reputation pressures, that can influence the timing of issuance on the reports.

By shifting the tide Muñoz-Izquierdo et al. (2018), made a significant discovery in the field by introducing the focus of the research into qualitative disclosures included in the emphasis of matter paragraphs, this research has found that the audit reports can contain far more useful information than just the binary classification of opinions, based on qualified and unqualified, the narrative content can show issues regarding asset valuation uncertainties or even going concern doubts, that can offer deeper insights into the nature of the firm, and the corresponding likely of default. Contemporary discussion can benefit from this type of information by incorporating into the regression models, the content, tone, and structure of the audit narrative, providing an open window for deeper exploration into the underlying mechanisms of financial deterioration.

2.4 Audit report disclosures in financial distress prediction

The research on how narrative disclosures can increment and improve financial distress prediction has emerged, because of the increased understanding that audit reports can provide crucial information than by solely looking at the binary conclusion of an audit opinion. The type of opinion, that is dichotomous, distinguished solely based on a qualified or unqualified opinion, has been a major component of traditional models such as Mutchler (1985) and Geiger & Raghunandan (2002). Although this method of addressing the primary issue may be relatively significant and quite helpful, but it may underutilize the rich qualitative information that it is possible to find in audit reports. Since the scholars have been more interested in the textual analysis and features of the reporting, the regulatory developments such as the introduction of the Key Audit Matters under ISA 701, have increased disclosure obligations.

One of the most influential contributes to the field, is the work of, Muñoz-Izquierdo et al. (2018), that discovered that the specific issues highlighted in the EoM paragraphs, as well as the qualification paragraphs, can provide a more and much deeper understanding of the reasoning behind the financial difficulties of businesses, that can culminate in a state of distress,

the work, was focused mainly on the illustration that these disclosures can provide a clear interpretation and predictive power to rely on, that is not captured by the mere final opinion of reports. Viewed upon this light, audit reports can be seen as a narrative map of the businesses' underlying vulnerabilities and flaws that can lead to financial difficulties.

Following the same line of action, studies in the broader audit reporting literature provide further explanation and support for the usefulness of narrative disclosures, the work made by Carcello and Neal (2000), showed that governance related audit report comments, particularly regarding audit committee concerns, are closely related to financial reporting risk, further and more contemporaneous work has been made regarding the study of textual analysis in order to examine the informativeness of KAM, by showing that the content, tone and the specificity of KAM disclosures give an increased incremental insight to investors and stakeholders. As suggested by the research of Muñoz-Izquierdo et al. (2019), capturing the interplay between the internal and external causes of business failure must require an approach that considers not only the significance and presence of risk signals, but also the qualitative characteristics and the relevance of the context in which the conclusions were written.

2.5 Linguistic Features of Audit Reports and the Role of Weak Modal Verbs in Distress Prediction

Recent studies and research have been made regarding the auditing field, that have showed that the informational value of the reports is incorporated in the linguistic characteristics of the story written by auditors, meaning that auditor's phrasing decisions can indicate the degrees of trust and uncertainty in the written work as previously stated, this new body of research serve as a pertinent fundament to the prediction of distress, as small linguistic clues may be of foremost importance in the incremental insights into the type of severity of the underlying concerns.

Seebeck and Kaya (2023), investigated the communicative value of expanded audit reports in UK and Ireland after the implementation of ISA 701 and KAM standards, that have made a real significant work in the field, they have documented notable changes in the readability and specificity in the document structure of the reports after the implementation, they used computational linguistic techniques to culminate into this conclusion, the discoveries demonstrated how the textual features can change over time, where the more precise wording chosen was perceived has having a stronger communicative insight, while also showing that better investors responses are strictly linked to an increased specificity in KAM disclosures, meaning that the investor sentiment and decision can be driven by the linguistic precision rather than by solely on the length on the audit report.

The researcher that investigated that thematic on tone and uncertainty in financial disclosures like the work of Li (2010), have found that tone change is significantly associated with both short-window return around the filing date and the drift returns in the post-filing period and this association is incremental to that due to accruals and earnings surprise, in the auditing domain, the textual analysis is something quite recent, and in constant development, however, some studies have express a basis for incorporating the use of weak modal verbs as a meaningful linguistic feature, while Smith (2023), revealed that changes in the readability and tone in extended audit reports under ISA 701, suggest that auditors are more careful and will adjust their language when communicating problems regarding financial risk, and also, that the report

tone changes with a higher occurrence of negative and uncertain words. On contrary Bédard et al. (2019), present their work, and show that the basis of linguistic analysis in French auditors, did not clearly influence the investor's perceptions. To conclude Wichuta et al. (2022), showed that the wording chosen in audit reports and that the tone embedded into KAM disclosures, can be the reason to influence the investors and stakeholders actions and perceptions, by stating that clear and concrete language improves informational clarity and drive the market reaction, it was also discovered that the KAMs readability is positively correlated with both absolute cumulative abnormal returns and abnormal trading volume.

The use of modal weak verbs is an important language variable for distress prediction, since it can record the degree of auditor hedging, which can be more sensitive to earlier signals, but are also a softer signal in comparison with going concern remarks. The weak modal verbs are important and increase the explanatory power of already stated textual measurements, since they can capture ambiguity, and where specificity language can capture and represent precision, and confidence. The line of reasoning, comes from the psychological literature made by Tversky & Koehler's (1994), in this early study, they showed that, while ambiguous or modal language impairs probability evaluations, precise information increases them. In this dissertation, a linguistic proxy for audit evaluation will be used, adding the weak modal verbs usage in the audit reports into the regression models, this intuition can help in the explanation of variation that conventional qualitative information may not be able to fully capture, this method goes in alignment with the new developments in the field as it directly addresses calls in the auditing literature for more textual interpretation and analysis inside audit reports.

3.Hypotheses Development, Data and Methodology

3.1 Research Question & Hypotheses

In Table 3.1 it is presented the research question and the set of hypotheses formulated, providing a block of research for the foundation of the study. The hypotheses were formulated, based upon on prior research examined in the Literature Review Chapter.

Table 3.1 - Research Question & Hypotheses

Research Question:

In which conditions can audit features and audit report linguistic tone impact financial distress in Portuguese listed firms?

Hypotheses:

H1: The combined use of the Altman's Z-Score model and audit reports made by Big4 firms leads to a more accurate prediction of distress.

H2: The frequency of modal weak verbs in audit reports increases with the number of Key Audit Matters disclosed, reflecting greater linguistic uncertainty in more complex audits.

H3: Audit reports containing heightened auditor warnings are associated with a higher KAM modality score, reflecting more intensive, cautionary disclosures.

H4: Auditor-specific characteristics, namely Big Four affiliation and auditor tenure, significantly influence the likelihood that auditors issue an emphasis of matter paragraph, beyond the explanatory power of firms' underlying financial distress.

H5: Firms classified in higher-risk financial distress zones exhibit higher KAM modality scores than firms in the Safe Zone.

H6: Industry classification is associated with systematic differences in audit reporting outcomes and firm financial condition.

3.2 Data

The dissertation examines 25 Portuguese listed firms between 2014 and 2024, by combining financial statement information, audit reports, and auditor-level characteristics. The research was built on an integrated dataset at the firm-year level, allowing the study of both distress prediction and their interaction with the dimension of audit reports and their communication.

Financial information was manually collected from SABI INFORMA, mainly because of the consistency that it provides. The data collected included balance sheet and income statement values that were required to compute the Altman Z-Score, as well as the supporting ratios that were calculated, to be used as control variables. For each firm-year observation, the following accounting ratios were calculated and stored: Working Capital to Total Assets (WCTA); Retained Earnings to Total Assets (RETA); EBIT to Total Assets (EBITTA); Book Value of Equity to Total Liabilities (BVETIL) and Sales to Total Assets.

With this information it was calculated the Altman Z-Score in accordance to the paper formula, represented in Table 3.2:

Table 3.2 – Equation for Altman’s Z-Score Model (1968):
 $Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + X5$

$X1 = \text{Working Capital} / \text{Total Assets}$

$X2 = \text{Retained Earnings} / \text{Total Assets}$

$X3 = \text{Earnings Before Interest \& Tax (EBIT)} / \text{Total Assets}$

$X4 = \text{Market Capitalization} / \text{Total Liabilities}$

$X5 = \text{Sales} / \text{Total Assets}$

It was created a variable called Distress Score, incorporating the findings made by Altman Z-Score, where, if the score was inferior to 1.80, the observation was captured as being part of the Distress Zone, if the coefficient was between 1.80 and 2.99, the coefficient was considered to be in the Grey Zone, and finally, for the coefficients superior to 2.99 were considered to be in the Safe Zone of distress. A binary indicator of Distress was also created by assessing the distress situation of a firm as short-term financial difficulties if the EBIT was negative.

Audit reports were obtained directly from corporate filings. From each report, it was extracted a binary variable in accordance to the audit opinion issued, separating with 0 for the qualified opinions and 1 for unqualified opinions, all Key Audit Matters (KAM), represented as the variable KAM, paragraphs were also extracted, along with the presence or absence of an emphasis of matter commentary, for simplification, the going concern comments was also included in the variable. Auditor entity was also coded by distinguishing Big Four auditors (PwC, EY, Deloitte, KPMG) from non-Big Four firms. Auditor tenure was also measured as the number of consecutive years each auditor served a client.

A linguistic variable was also created by applying a structured manual review of audit-report text, where it was calculated the Modality Score. This score was calculated as the proportion of the amount of the usage of modal weak verbs used by the total of words that the report had, the score reflects the frequency of hedging terms such as “might,” “may,” “possibly,” “subject to,” and other similar modal expressions commonly used. Audit language was also recorded as a control variable with reports written in Portuguese or English, to test out whether linguistic uncertainty varies across language environments.

A variable was also created to assess if the change in auditor firm, from one year no another could have any impact in the regressions, in this sense, a binary variable was created by equaling 1, if by the same client firm, the audit company was changed from one year to another and 0 otherwise. To assess industry effects the audit clients were separated in five different industries: Consumer Goods, Retail & Diversified Services; Natural Resources, Energy & Industrials; Regulated & Infrastructure; Sports Clubs; Technology, Media & Entertainment.

The final dataset combines financial data, textual linguistic indicators, auditor characteristics and attributes, and industry classification for a decade of reporting history. This structure supports a multi-dimensional both quantitative and qualitative analysis of audit reporting, where uncertainty signals, auditor conservatism and financial distress were also considered.

3.3 Methodology

As previously mentioned, this research is built upon to evaluate two complementary dimensions of corporate reporting: first, whether the audit quality can contribute to predicting financial distress beyond traditional accounting-based models; second, whether the linguistic tone and uncertainty transmitted in reports can reflect audit complexity. By structuring the empirical work around six hypotheses, the objective is to fully capture both financial and textual layers of audit communication. The program used to test the hypotheses formulated was STATA, by using the programming language to perform the regressions.

Financial distress was measured using a modified Altman Z-Score approach. The Z-Score was computed for all firm-years between 2014 to 2014 using the traditional formula composed of the five accounting ratios previously stated in this thesis. Instead of defining distress based on Z-Score thresholds, this study classifies a firm as being distressed when their EBIT is negative, this approach is commonly accepted in prior literature, distress is being fully captured by operational losses rather than mechanically by the scoring model itself.

The first part of the analysis investigates whether audit quality can be the reason of the improving in distress detectability. A logistic regression was estimated with financial distress as the dependent variable and Z-Score and Big Four as the explanatory factors.

The second stage of the methodology evaluates uncertainty through linguistic tone. Audit complexity was quantified through the number of Key Audit Matters disclosed.

Auditor-specific characteristics were studied using a logistic model that can predict if an audit report contains an emphasis of matter paragraphs (EoM). Big Four status and auditor tenure were also taken into consideration as independent variables alongside with financial controls and distress indicators.

The fifth stage links textual tone to financial condition. A panel regression was then estimated to examine whether the modality score increases or decreases across risk categories. This approach clarifies whether uncertainty language signals distress or instead reflects audit-engagement complexity.

Finally, industry effects were examined through sector grouping. A one-way ANOVA tested whether modality scores can vary by industry, while a Kruskal-Wallis's test evaluated the differences in the number of KAMs across the sectors.

4. Empirical Findings

4.1 Combined Altman Z-Score

The objective of this first analysis was to examine, whether the combination of the traditional Altman Z-Score and the information gathered on the audit reports, regarding the audit companies that issued the opinions, namely Big Four companies, could improve the prediction power of corporate financial distress. It was conducted a multi-staged procedure that was designed to construct a reliable distress indicator, by incorporating audit-quality information, and to estimate the predictive ability of the Big Four auditors relative to the established Altman Z-Score.

The Altman Z-Score was computed for each firm-year observation from 2014 to 2024, using the standard formulation, which consists and integrated five financial ratios: (WCTA) working capital to total assets; (RETA) retained earnings to total assets, (EBITTA) EBIT to total assets, (BVETIL) book value of equity to total liabilities and sales to total assets.

As stated previously the critical challenge when using the Altman Z-Score is that the distress indicators derived directly from the Z-Score thresholds results in a perfect prediction when the Z-Score is included as a regressor. To resolve this, and to generate an economically meaningful distress proxy, it was defined as a distress firm, based on operational performance, since negative EBIT is a widely accepted indicator in global literature of short-term financial difficulties, and it truly reflects the firm's inability to generate positive operating income.

To test if the auditor reputation has a meaningful impact in the improvement of distress prediction, it was needed to create a variable that is equal to 1 if the firm in question was audited by the four major audit firms and 0 otherwise. Big Four audit firms are usually related with greater monitoring intensity, higher audit quality, and stricter reporting standards; therefore, this variable could capture information regarding latent financial complications that cannot be solely captured by the Altman Z-Score alone.

The model converged successfully and produced a statistically significant likelihood ratio test, indicating that the predictors jointly contribute to explain distress. The results can be seen on Table 8.1.1.

It is possibly to state that the value of Z-Score was not lost, since it remains with a statistically and significant coefficient, in this dataset, higher the Z-Score, greater the likelihood of EBIT-bases distress, which makes sense, by suggesting, that the components of the Z-Score related to capital structure and asset composition may not fully align with the operational profitability for those firms, therefore it is foremost importance the use of several distress indicators.

The coefficient for the Big 4 is statistically significant and positive, meaning that even after controlling for the Z-Score, the companies that were audited by the four major firms, were more likely to be classified as distresses according to EBIT performance, however, this does not mean that Big 4 reflects on distress, rather, that Big 4 tend to audit larger firms with a more complex financial environment, that may temporarily report operational losses. Even more this audit firms may identify and disclosure financial issues more rigorously, meaning that audit quality

contains information that the Z-score cannot fully captured by itself, the results show that incorporating audit-quality indicators, clearly improves the financial prediction on these firms.

In sum, by constructing an EBIT-based distress measure independent of the Z-Score, integrating audit-quality information from Big 4 auditors, and estimating a logistic regression model, shows that the audit reputation is not solely a status point, but rather, contribute to meaningful incremental value to the financial distress prediction.

The extended model, which includes the Z-Score, Big 4 audit status, and the individual financial ratios (WCTA, RETA, BVETIL), shows a significant overall fit, and a high pseudo-R squared of 0.523, as stated in Table 8.1.2. Z-Score and the accounting control variables exhibit strong and highly significant coefficients, indicating that liquidity, cumulative profitability, and leverage remain key drivers of EBIT-based financial distress. However, the coefficient of the Big 4 firms, becomes statistically insignificant once the controls are added, this suggests that the incremental predictive value of this variable is absorbed by more fundamental financial indicators. In other words, the companies that are audited by non-big four firms tend to be systematically different from the ones audited by big four firms in terms of liquidity, profitability, and leverage. Once these structural differences were controlled, the additional predictive power of the variable was absorbed, it is possible to conclude that the presence alone of this variable does not predict directly financial distress after controlling for financial structure of the clients audited.

These main results provided a partial support for the hypothesis stated above, suggesting that audit quality enhances distress prediction only when paired with the Z-Score in a simplified model, but its effect is overshadowed by more granular financial ratios that can capture directly liquidity, profitability, and leverage.

4.2Relation between modal weak verbs and KAM

To evaluate if the linguistic approach and the uncertainty embedded in the auditor's report can increase with audit complexity, it was needed to assess the frequency of the presence of the use of modal weak verbs in each annual report, as well as the number of KAMs disclosed. Modality score was presented and calculated to be a continuous measure that could capture the intensity of the use of modal weak verbs, the analysis will focus on this variable and the interplay with others. The other variable in question is KAM, that states the amount of KAM displayed in a single report. This empirical analysis was designed to test if auditor employ more cautious behaviors when confronted with a more demanding engagement work.

As an initial step, a pairwise Pearson correlation was conducted, between both variables, the coefficient showed a positive and statistically significant relationship, meaning that the audit reports that contain a greater amount of KAM tend to exhibit a greater linguistic uncertainty, meaning an increased modality score, being sustained by previous literature, although the magnitude was not high, it can serve as the basis point to the following deepening research

After the first step, to formally asses the relationship it was estimated a bivariate ordinary least square (OLS) regression model, the results presented in Table 8.2.1 reinforced the previous findings, since the coefficient in the KAM variable is 0.479, indicating that an additional KAM

comment is associated with an increase of approximately 0.48 in the modality score, the results are robust, with a 95% confidence interval, which clearly excludes the possibility of a null effect. The results were modest, such levels, however are quite common in regards to textual and linguistic approaches, since the narrative that is chosen, can reflect a full set of economic or even stylistic influences that can go beyond any single determinant that alone drives the model.

All the findings provide a clear empirical basis for the hypothesis, since audit reports that contain a greater amount of KAM disclosures, represent the main indicator of complexity, that inherently result in expression modal construction. The pattern goes in alignment with the interpretation that auditors intensify hedging language when faced with more complex and difficult engagements, also it shows that linguistic behavior is not merely stylistic but as a channel through which audit firms, can report and signal caution or increased professional judgment. The use of modal weak verbs appears to serve as a linguistic drive that is reflected in more complex audits.

To assess if the results can differ in auditors reports by the language in which they are issued, a two-sample t-test was performed by comparing the mean modality score between the audit reports written in Portuguese and English, the results in Table 8.2.2 have shown a pronounced divergence between the two regarding modal weak verb usage.

The reports written in Portuguese show a higher mean level of uncertainty, meaning that the average modality score was superior, implying an average difference in the modal expression used, the difference is statistically strong and significant, with confidence intervals that fully exclude the possibility of equality in means.

In practical terms, language differences suggest that this is not merely a neutral reporting vessel, but rather, interacts with the stylistic and communicative conventions applied by audit firms.

The implications of these findings in further empirical analysis are clear since substantial linguistic divergences cares for a necessity of controlling for language in audit reports, the models that failure to do so, would result in risks regarding language specific tendencies with the audit and client features.

To deepen even further the analysis, a cross tabulation of report language and auditor type revealed a striking and significant association between the two variables, since among English reports, they are virtually all issued by Big Four audit firms, around (99.5%), while Portuguese ones are only produced (46.5%) of the times by this top four major firms. The Pearson chi-square test can confirm that the report language is systematically related with auditor type.

Since the two types often rely on distinct documentation templates and risk-communication practices, this imbalance suggests that auditor identify may partially be explained by the higher levels of linguistic uncertainty observed in Portuguese written audit reports.

Furthermore, with the sole purpose of disentangle these effects, it was also estimated a model that included both Portuguese written reports and the Big Four dummy variables as predictors of the modality score, the results were quite interesting, and can be observed in Table 8.2.3, since they provided a clear view, since, once the auditor type was included in the model, the language effect dissipated, the coefficient on the Portuguese written variable has become statistically insignificant, showing that after is controlled for who authored the report, those

who were written in the Portuguese language, no longer can display higher uncertainty, in contrast, the coefficient in the Big Four has remained large, negative and significant, meaning that this variable consistently produces the audit reports that have a lower usage of modal weak verbs, while the non-Big Four tend to rely more heavily on these modal constructions.

These results suggest that the initial differences in the linguistic uncertainty attributed to language, were in fact, a reflection of the auditor specific communicative procedures practiced by the firms involved. Since Portuguese reports were disproportionately produced by non-Big Four firms, the linguistic pattern was confounded by the auditor type, the evidence can show clearly that the variation arises not from the linguistic characteristics of Portuguese written reports per se, but from differences in disclosures templates, adopted by the type of audit firm. We can state that narrative audit disclosures are not merely shaped by the audit characteristic, and that further analysis should incorporate the Big Four variable as variable of interest.

4.3 Auditor warnings and Modality Score

The first test regarding this chapter was on seeing if the number of KAM would be increased with in cases of a qualified opinion, however, there is a clear limitation in the dataset, since the number of formally qualified opinions is quite low, since the data reflects on audit reports on the 25 listed companies in Portugal, as expected the great majority of opinions are of unqualified ones. To address this imbalance, a broader concept was studied to capture emphasis of matter and going concern paragraphs, that represent substantive auditor signaling even in the absence of a modified opinion.

Audit reports that contained an EoM or going concern regards exhibit a clear higher modality score in comparison to those of a clear, unmodified opinion, a two-sample t-test was performed and confirmed that the difference was statistically significant, that provided a strong and robust evidence that auditors respond to the increase in uncertainty by not disclosing additional KAM, but rather by using more intensive, complex or cautionary language in the audit reports.

By doing a regression analysis, with the appropriate controls, the conclusion was reinforced, available in Table 8.3.1 since the coefficient of the EoM indicator was positive and statistically significant across specifications, meaning a consistent relationship between the warnings issued by the auditors and the modality scores. The results support the view that in increased uncertainty, auditors deepen the narrative content, while leaving the number of KAMs virtually the same.

The focus shifted to a multivariate regression analysis that can provide a stronger and more nuanced evidence on the relationship above, where the results can be observed on Table 8.3.2. After controlling for firm-level financial characteristics, regarding, auditor attributes, indicators of financial distress, and year fixed effects the coefficient of the variable remained positive and statistically significant, making the results even more robust. Even when confounding factors are held constant, the relation between EoM paragraphs or going concern is still associated with an increase in the modality score. This main result shows that these two paragraphs are associated with an increase in the reporting detailing. This pattern arises because, under elevated constraints in the environment of the client company, the auditors will try to justify and articulate the nature of their professional judgement more explicitly, ISA 701 emphasizes that KAM should convey the “how” and “why” a matter was significant to the report, meaning

that in this cases, the deeper narrative involved offers users a clearer signal of the underlying difficulties faced in the audit and it aligns closely with the communicative intent of the standard ISA 701.

Furthermore, it was also tested if the change of audit firm from one year to another would result in a smaller KAM, or even a smaller modality score, the comparison across years, with and without rotation reveals no significantly statistical meaningful difference, meaning that even with a marginally lower modality score, this decrease is not large nor significant, this suggests that this effect shows that the linguistic intensity is not embedded into the appointment of a new audit firm providing the services.

This stability is significant since it can be confirmed that the KAM disclosures follow procedures that are codified and standardized by the ISA 701 framework, that imposes strict guidelines on how the structure, content, and the minimum number of explanatory elements should have on each key audit matter. This regulatory, reveals in the degree of uniformity across audit firm, especially when looking in Big Four audit firms, also, this firms operate in a global integrated methodologies where all firms should use default templates, so, even if the audit company changes, the incoming firm will follow the same protocols established. Auditor rotation in the Portuguese market, in similarity with other EU countries, is governed by mandatory rotation cycles, to guarantee independence, rather than sudden changed driven by audit complexity.

4.4 Drivers of Emphasis of Matter Paragraphs

While previously analysis was focused on showing that EoM disclosures are strongly shaped by the firm's financial conditions, this chapter is trying to examine whether the auditor level characteristics further influence and enhance the issuance of such warnings in financial distressed companies. The motivation was built upon two distinct stands of audit research, on one hand, Big Four auditors are mostly and widely understood to be the main players that apply stricter methodologies with a more conservatism approach, leaded by higher professional skepticism, in comparison to non-Big Four companies, by facing an increased reputational risk, on the other hand, the motivation lies on if audit tenure can play an important role in the auditing debate, meaning that it can be a strong source of either audit quality, via audit client specific knowledge or even by reduced independence due to familiarity with the client institution. In this analysis the focus is in trying to dissect if these two attributes of audit features can meaningfully alter the likelihood that an EoM paragraph is being issued, beyond the explanatory power of firm's underlying financial distress.

A logistic model was performed in which the variable of interest was the emphasis of matter binary variable, being the dependent variable of this main regression. The specification included the previous financial variables already established as key predictors of distress, and the commonly used Altman Z-Score, alongside with auditor specific variables of interest, Big Four, and tenure, plus, their interactions variables with financial terms, this interaction terms, were included, with the sole purpose not only to see if this properties matter, but to assess if they

systematically amplify or attenuate the responses of auditors to financial deterioration, the standard errors in the regression were clustered at the firm level, and the fixed effects by year were introduced to absorb the common shocks in the reporting behavior.

The results of this regression provide an obvious pattern, firm's financial fundamentals remain the dominant drivers of EoM disclosures, as expected, with the financial drivers, maintaining strong statistical significance and large magnitudes, reaffirming what has been discovered in prior literature that these disclosures are fundamentally rooted in economic conditions rather than simply stylistic differences in auditor judgement.

Among the features of the audit firms, the Big Four affiliation emerges as the only significant predictor of EoM issuance, they display higher material propensity to include EoM paragraphs, even after controlling by financial conditions. These findings are truly consistent with literature portraying Big Four companies has more conservatist, increased and more robust methodologies and reputational concerns that reflects clearly on the number of EoM issued.

In contrast, with this conclusive findings, tenure exhibit no meaningful influence of companies issuing an EoM paragraph, neither the main effect of tenure, nor its interactions with distress indicators reach statistically significance, this suggest, that in the Portuguese listed firms, studied, auditor familiarity does not compromise the auditor's willingness to communicate increased complexity to its investors nor does it change at least meaningfully their sensitivity to financial distress indicators, the conclusion focus on finding that client and audit familiarity does not reflect on a low guard in the reporting discipline, and professional excellence, especially in Big Four companies.

4.5The Impact of Distress Zones in Linguistic Features

Given the earlier findings demonstrated along this research, it was discovered that a strong relationship is present between financial distress and the issuance of EoM paragraphs, so, it is natural to examine if distress zones also influence the linguistic tone and the intensity aligned with KAMs disclosed. Since the modality score capture the degree of caution and uncertainty in the audit reports, financial distress may compel auditor firms to adopt a more alert and prudential tone in describing their procedures. The research purpose, is therefore, to test whether firms operating in the Distress and Grey Zones described by Altman Z-Score exhibit systematically higher or lower modality scores in their KAM disclosure compared to firms in the Safe Zone.

The fixed effects regression that examines the relationship between financial distress zones and the modality scores, reveal a nuanced pattern, by using the distress zone as the reference category, the results clearly indicated that firms in the grey zone do not exhibit statistically different modality scores from distressed firms, suggesting that auditors adopt a quite similar notion and tones when describing KAMs for firms experiencing financial pressure, whether moderate or severe. In surprise effect, firms in the safe zone, present a significantly higher modality score compared with distresses firms, by holding everything constant, when a firm's financial distress increases by 1 unit, its modality score increases by about 0.73 units, as observed in Table 8.4.1, within the same firm over time, however, this does not contradict with

the previous findings, since the number of KAM disclosed does not follow a statistically significance correlation with distress, they are two independent concepts, indicating that the linguistic intensity of KAM is greater in financial stable companies, which makes sense from previous findings, since it is reflected that, modality captures the complexity and technicality of auditor judgements rather than direct financial distress risk in firms. Safe Zone firms are more likely to operate with a broader, more sophisticated business activities and accounting systems, which give rise to a more elaborate KAM narrative, while in contrary, distressed firms, tend to exhibit more regular, less complex reporting environments, limiting the depth or nuance reflected in KAM language. The financial ratios that were included in the model as control variables remain strong predictors of modality, reinforcing the view that the tone in disclosures is shaped primarily by the firm's operational and financial structure rather than defined categorically by financial distress levels.

To further assess whether the linguistic uncertainty varies with a firms financial condition, an additional fixed-effects regression was estimated by using a binary indicator for increased financial distress, it was constructed on the reasoning that equals one for firms classified in either distress or grey zones, and zero for firms in the safe zone, this formulation isolated the firms operating under elevated default risk and sees if auditors adjust the modality score, in accordance to contemporaneous financial weakness.

The results were clearly stating a negative and statistically significant coefficient, indicating, that after accounting firm fixed effects, year fixed effects, clustered at the firm level, and the full set of financial controls, the firms in the distress and grey zone, as expected from the previous findings, still show lower modality scores than firms in the safe zone, it appear that audit firms, are less linguistically cautious when reporting for firms experiencing increased financial strain

The suggestion made by the discovery is that modality and distress capture two distinct information channels, inside the same audit report, while the EoM paragraphs communicate the explicit concern of the auditors, that is triggered when material uncertainties justify direct emphasis of the comments, modality, capture the subtle linguistic shading, that does not seem to intensify when the client firm is in a distress situation or not. It is important to address that this provides complementation on previous discoveries, since in prior results it was found that the modality score is positively correlated with the complexity of the audit engagement, consistently foes in alignment that auditors hedge more when addressing more demanding audits. KAM count and modality scores speaks to the internal structure of the auditor's narrative, while this new result is strictly related with showing that modality is not a channel through which auditors communicate concerns about business viability.

It was further examined if the auditors adjust the linguistic tone in a response to changes in firm's financial health, a fixed-effects panel regression was calculated by using the categorical variable of distress score as the main predictor of interest. The specification allows to assess whether firms in higher risk financial zones, meaning, distress or grey will receive systematically audit reports with an increase in modality, the model included the previous stated financial controls, audit size variable, audit characteristics, year fixed effects, with standard errors clustered at the firm level.

To no surprise, the results how that the distress score is positively and statistically significant, by taking it at face value, the coefficient indicates that movement towards a better financial

zone, is directly associated with a higher modality score, firms, with a relatively strong and more stable financial condition, showed an increased modal weak verb usage in the narrative of the reports, while firms in worse financial condition exhibit less. This pattern clarifies the distinction made previously, modality score rises with increased financial conditions, and is not a distress-communication mechanism, by summing all this up, the regression contributes to an important dimension to the thesis: while modality is increased with heightened audit complexity, does not function as a prediction of distress. Auditors rely more heavily on discrete structural elements of the audit report.

4.6 Industry Effect

In this chapter the focus was on understanding if industry classification had any impact in the modality score shown inside audit reports for each industry specification.

A one-way ANOVA was conducted comparing the mean modality score across the five industry group across the dataset, although the descriptive statistics suggests modest differences in average modal verb usage, the modality score was showing higher levels among manufacturing-oriented firms and marginally lower levels in service sectors, the results from the ANOVA test, revealed that these differences were not significant, meaning, that industry classification, by itself, it not enough to meaningfully explain the variation in the use of weak model verbs by audit firms.

Also, the Bartlett's test rejected the assumption of equal variances across different industries, confirming a substantial heterogeneity in the dispersion of modality scores, however, even under this more conservative condition, no evidence emerges to suggest that the auditors will adopt systematically different linguistic approaches, depending on the sector in which the client operates in, this is conclusive, in the sense, that the pattern goes in alignment with the broader findings of the thesis, concluding that the linguistic uncertainty in audit reports appears to be driven primarily by the audit complexity, auditor characteristic, and the risk-related disclosures, rather than by the industry sector.

However, the analysis of the KAM disclosures reveals a markedly different patter, to examine whether the quantity of KAM reflect sector specific behavior and audit complexity, a Kruskal-Wallis nonparametric test was done, by comparing the magnitude of the variable KAM across the five industry categories.

The findings suggest that the number of KAMs disclosed differs meaningfully across different industries, and this divergence is reinforced by the rank sum statistic that was effectuated, that showed, that industries, typically characterized by heavier regulations and increased operational uncertainty, are systematically receiving a greater amount of KAM disclosures, in contrary, the sectors that are considered more stable tend to exhibit fewer report matters.

This goes in alignment with the full purpose and the conceptual nature of KAMs as engagement specific disclosures of the complexity in an audit, unlike the linguistic tone of the auditor's narrative, that is more driven by auditor-level and uncertainty factors, the volume of KAMs reflect structural issues related to the client's environment, the evidence suggest that industry classification plays a big role in the shaping the breadth of audit reporting obligations, even if

it does not materially influence the uncertainty beyond the textual formulation of those same disclosures.

To further explore the hypothesis, an additional set of models were included by incorporating a “dominant factor” variable, a variable, that is able to detect if a specific industry is primarily audited by a single major audit firm, this design allows us to test if market concentration within a specific industry affects the three key dimensions already studied: the number of KAMs, the modality score and the financial condition of the client firm, separated by the three zones of distress in Altman Z-Score

The extension was motivated by the recent literature on audit market structure, that shows that concentrated audit environments may lead to either an increased standardization or a reduced competitive pressure, potentially resulting in an influenced audit communication even if the audit quality is formally regulated, since the Portuguese listed and public-interest entities market is quite small, variation in auditor

In the first regression, an ordered logistic regression examined if the dominance of an audit firm within a specific industry, together with industry membership and financial features, can help explain the number of KAM disclosed in audit reports, the results presented that the dominant auditor variable is not statistically significant, as shown in table 8.5.1, indicating that an auditors influence within an industry will not systematically alter the KAM disclosed. In contrast, the year fixed effects are highly significant, showing that the changes in regulatory environment, audit practices or even macroeconomic conditions play a more important role in determining the number of KAMs disclosed than industry or auditor dominance.

The second model was focused on examine if the modality score is associated with the auditor’s dominance in an industry, the results, on Table 8.5.2 showed that the dominant factor does not explain the degree of modal weak verb usage, as the coefficient is small and statistically insignificant. Industry differences also failed to provide statistical significance, although the coefficients vary in sign, none of the industry categories were able to predict changes in modality. Among the financial controls, only RETA, meaning, profitability, by showing that higher profitability is associated with lower modality scores, indicating that more robust companied receive reports with a less cautious tone. Regarding the year fixed effects, the results showed that the annual indicators are significant, reinforcing the idea that macro-level reporting environment of even cycles contribute to shifts in the stylistic tone and structure of reports.

In this third and final regression model it was evaluated whether the presence of a dominant auditor within an industry influence the distress score, the coefficient, as shown in Table 8.5.3, for the dominant auditor is positive but insignificant suggesting that industries in which a given firm holds substantial market share do not, on average exhibit better or worse distress classification, in contrary several industry categories display significant effects, since firms in the Natural Resources, Energy & Industrials show that they are more likely to fall into the safer financial zones, since they operate in a more stable economic environment and benefit from business models that are less exposed to distress.

Conversely, the Regulated & Infrastructure sectors have shown a moderately negative coefficient, while the Sport Club sector have displayed an even stronger significant coefficient, these results make sense, in a way, since Regulated & Infrastructure companies rely more heavily on capital intensity and long investment cycles, also, they require very high upfront

fixed investment that is largely financed through debt, also their revenue adjustment mechanism, are also quite politically constrained, by reducing their flexibility, being more vulnerable to adverse conditions. The intensity was even higher in the Sports Club sector in alignment with the natural basis of this firms, since they rely mainly on unstable earnings, like players trading, this generated weak solvency indicators and make the firms more prone to distress risk.

These results help to show that distress, is not fully determined by firm level ratios, but industry sectors can play a big role as well, it carries enough explanatory power, confirming that solvency risk is partly embedded in a company's context, beyond what traditional financial ratios are able to capture.

5.Conclusions

This thesis set out to examine if the audit related information, regarding both the structural and linguistic features, could enhance the prediction and interpretation of financial distress beyond traditional accounting-based models. Using a hand-collected panel of audit reports and financial statements from 25 Portuguese listed firms between the time intervals of 2014 and 2024, the study integrates financial ratios, auditor features, and audit reports features and linguistic characteristics into a unified empirical framework, in doing so, it responds directly to long standing calls in the previous literature to go beyond the purely quantitative distress models and to exploit the informational richness that is incorporated into audit reports.

The empirical findings provided with several relevant insights. Firstly, the traditional indicators, summarized by the Altman Z-Score and its underlying accounting ratios, remain the primary drivers of financial distress classification, namely, liquidity, leverage and profitability consistently help to explain financial distress risk in companies, confirming the contemporary endurance of the model. It was also discovered that audit quality contributes largely to the incremental power in simplified specifications, namely, the presence of Big Four auditor improves distress detectability when it is combined with the Altman Z-Score, although this effect is absorbed once granular financial controls are included, this suggest that audit reputation dos not solely and independently predicts distress but it reflects underlying client features that are ultimately captured by financial characteristics and that can help improve the prediction model on distress.

Secondly, the thesis provided strong evidence that the linguistic uncertainty in audit reports, represented by the modality score is closely tied to the audit engagement complexity rather than directly to distress risk. The frequency of weak modal verbs increases systematically with the number of KAM, confirming that auditors rely more on uncertain language when in face with a technically demanding or more with more judgement intensive audits, this relationship holds, independently with the firm's distress risk status, this reinforces the interpretation that the KAM narratives are designed to communicate complexity judgement rather than business viability risk.

In third place, it was found that formal audit warnings, related to going-concern and EoM paragraphs emerge as the primary channel through which audit firms translate increased financial risk. These disclosures are strongly related with financial distress risk and are accompanied with higher linguistic intensity, even when the number of KAM disclosed are stable. It was also found that Big Four audit firms, are most likely to issue this type of warnings, because, of their, perceived conservatism and reputational concerns, while the tenure associated does not seem to show any influence in reporting rigidity. Foremost, audit disclosures show limited forward looking predictive power, as auditors work rely heavily on contemporaneous financial conditions of the clients, rather than anticipating the future pressure that the client firms can face in the future.

Fourth, the analysis done, revealed a clear separation between linguistic tone and distress communication, meaning that the firms that were in the distress or grey zones do not exhibit higher modality scores, but rather, safer firms, tend to display more linguistic uncertainty in their reports, the findings suggest a key contribution, meaning, that linguistic tone and distress represent distinct informational patterns and dimensions within the same audit report, while the modality captures the complexity involved, distress is conveyed through explicit mechanism such as EoM disclosures.

Finally, the industry effects were also taken in place for the study, they mattered primarily through the volume of KAM disclosures and financial conditions of firms, rather than through linguistic tone, it was found, that certain sectors, such as the most regulated ones, and sport clubs, are by structure, more prone to distress, while the audit language used remained virtually standardized across industries, in accordance with regulatory harmonization under ISA 701.

Overall, the thesis, contributes to previous literature findings, by demonstrating that audit reports are not merely compliance documents, but structured communication tools that can be seen as signaling channels. While accounting data remain the central focus on distress prediction, the audit disclosures can prove with slightly increased predictive power, but they are mostly related to audit complexity instead. Taken together, the findings offer meaningful evidence for academics, auditors, and broader market participants seeking a more nuanced understanding of financial distress and audit communication.

6.Limitations and Further Research

Although this study yielded valuable results, there are a few limitations to be aware of, firstly, since the dataset focuses on 25 public large companies in the Portuguese market, it was necessary to ensure that the audit information was available for each of the companies. This was a difficult task because most of the companies that were analyzed lacked sufficient audit information to create a structured dataset; in this case, it was necessary to use other companies that were not planned and might not be able to provide more intriguing and varied conclusions.

Regarding the preparation of the KAM disclosed in each one of the audit reports, and as well as the modality score that was calculated, mainly through approximation, some human errors could be seen. In this case, the amount of KAM and modality score are prone to human mistakes.

Further research, could extend this framework to larger and international samples, with an automated textual analysis, that could be constructed by machine learning techniques and artificial intelligence, that could also help explore the investor reactions to the linguistic audit signals. With these more complex and reliable models with will be possible to analyze better thoroughly the textual and linguistic variables inside audit reports, on the other hand, with an increase sample size of firms, the results, could create more interesting patterns to the literature that this thesis could maybe not be able to achieve.

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8. Appendix

8.1 Combined Altman Z-Score

8.1.1 The influence of Big Four Audit firms

VARIABLES	(1) H1: The combined use of the Altman's Z-Score model and audit reports made by Big4 firms leads to a more accurate prediction of distress
Z_SCORE	0.2870*** (0.0944)
BIG4	1.0245** (0.4029)
Constant	-0.0779 (0.4110)
Observations	275
Pseudo R-squared	0.0591
Observations	275

8.1.2 Regression with controls

VARIABLES	(1) H1 with controls (Altman Components)
Z_SCORE	14.0361*** (2.2538)
BIG4	0.8171 (0.5965)
WCTA	-16.8346*** (2.9957)
RETA	-20.9762*** (3.4571)
BVETIL	-8.0077*** (1.3182)
Constant	-0.5216 (0.8230)
Observations	275
Industry FE	No
Year FE	No
Pseudo R-squared	0.523
Observations	275

8.2 Modal Weak verbs and KAM

8.2.1 Modal Weak Verbs and KAM

(1)	
VARIABLES	H2: The frequency of modal weak verbs in audit reports increases with the number of Key Audit Matters disclosed, reflecting greater linguistic uncertainty in more complex or higher-risk audits.
KAM	0.4792*** (0.1208)
Constant	8.0554*** (0.3574)
Observations	275
R-squared	0.0545
Industry FE	No
Year FE	No
R-squared	0.0545
Observations	275

8.2.2 Difference in Means

(1)	
VARIABLES	Difference in Means: Audit Modality Score (By Language) (H2)
KAM	0.4792*** (0.1208)
English Reports	8.0554*** (0.3574)
Observations	275
R-squared	0.0545
Observations	275

8.2.3 OLS Model

VARIABLES	(1)
	OLS Model: Audit Modality Score (H2)
PT_REPORT	0.9197 (0.6374)
BIG4	-4.3309*** (0.7996)
Constant	12.6256*** (0.8317)
Observations	275
R-squared	0.2162
Industry FE	No
Year FE	No
R-squared	0.216
Observations	275

8.3 Auditor Warnings and Modality Score

8.3.1 OLS Model with Controls

VARIABLES	(1)
	OLS Model: Audit Modality Score (Full Controls) (H3)
EMPHASIS_MATTER	2.0148*** (0.5629)
WCTA	-0.6176 (1.3325)
RETA	5.1070*** (1.4977)
EBITTA	0.3961 (3.7550)
BVETIL	0.8649 (0.5900)
Z_SCORE	-1.5785 (0.9978)
Constant	6.8908*** (0.2726)
Observations	275
R-squared	0.4921
Industry FE	No
Year FE	No
R-squared	0.492
Observations	275

8.3.2 Fixed Effects Model

VARIABLES	(1)
	FE Model: Audit Modality Score (H3)
DISTRESS_SCORE	0.7181** (0.3330)
WCTA	-0.4000 (1.2626)
RETA	-1.0598 (0.7729)
EBITTA	-2.1174** (0.9284)
BVETIL	-0.0364 (0.0398)
BIG4	0.9077 (1.5581)
Constant	7.4659*** (1.6094)
Observations	275
Number of company_id	25
R-squared	0.1294
Firm FE	Yes
Year FE	Yes
SEs clustered by firm	Yes
Within R-squared	0.129
Observations	275

8.4 The Impact of Distress Zones in Linguistic Features

8.4.1 Modality Score in Distress Zones

VARIABLES	(1) FE Model: Audit Modality Score (H5)
DISTRESS_SCORE	0.7275** (0.3318)
WCTA	-0.3055 (1.2775)
RETA	-0.9136 (0.8115)
EBITTA	-1.8501* (0.9763)
Z_SCORE	-0.0822 (0.0639)
BIG4	0.9106 (1.5593)
Constant	7.4490*** (1.6097)
Observations	275
Number of company_id	25
R-squared	0.1300
Firm FE	Yes
Year FE	Yes
SEs clustered by firm	Yes
Within R-squared	0.130
Observations	275

8.5 The Impact of Industry Sectors in KAM disclosures

8.5.1 Auditor Dominance Indicator

VARIABLES	(1)
	Ordered Logit Model: KAM Disclosures (H6)
dominant_auditor	0.0767 (0.3248)
Natural Resources, Energy & Industrials	1.4893 (0.9367)
Regulated & Infrastructure	0.8598 (1.0898)
Sports Clubs	0.3548 (1.1558)
Technology, Media & Entertainment	1.6670* (0.9304)
WCTA	-0.9476 (0.8927)
RETA	-0.2831 (0.3546)
EBITTA	-1.0702 (1.0152)
BVETIL	0.0865 (0.0623)
BIG4	-0.0787 (0.9111)
tenure	0.0016 (0.1399)
Observations	275
Industry FE	Yes
Year FE	Yes
SEs clustered by firm	Yes
Pseudo R-squared	0.131
Observations	275

8.5.2 Auditor Dominance in Modality Score

VARIABLES	(1)
	OLS Model: Audit Modality Score (H6)
dominant_auditor	-0.0902 (0.5223)
Natural Resources, Energy & Industrials	-0.0975 (1.1432)
Regulated & Infrastructure	-0.6070 (1.4735)
Sports Clubs	-0.0549 (1.2646)
Technology, Media & Entertainment	-0.1001 (2.2640)
WCTA	-3.1629 (1.9046)
RETA	2.6544*** (0.4618)
EBITTA	-4.4187* (2.2124)
BVETIL	-0.0827 (0.1001)
BIG4	-1.2163 (1.3604)
tenure	0.1994 (0.2412)
Constant	7.3652*** (2.0335)
Observations	275
R-squared	0.5104
Industry FE	Yes
Year FE	Yes
SEs clustered by firm	Yes
R-squared	0.510
Observations	275

8.5.3 Auditor Dominance in Financial Distress

VARIABLES	(1)
	Ordered Logit Model: Financial Distress (H6)
dominant_auditor	1.4827 (1.6321)
Natural Resources, Energy & Industrials	7.4314*** (1.4759)
Regulated & Infrastructure	-9.4963* (5.6870)
Sports Clubs	-22.9319*** (3.6888)
Technology, Media & Entertainment	-4.7237 (4.7667)
WCTA	42.3691** (19.0759)
RETA	8.1091 (8.6464)
EBITTA	199.9018** (95.3673)
BVETIL	58.5408** (27.2595)
BIG4	-8.2982 (5.4365)
tenure	0.3751* (0.2133)
Observations	275
Industry FE	Yes
Year FE	Yes
SEs clustered by firm	Yes
Pseudo R-squared	0.955
Observations	275