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PREFACE

Dear readers,

it is my pleasure to introduce a collection of papers from the 16th annual international scientific conference **European Financial Systems 2019** organized annually by the Department of Finance of the Faculty of Economics and Administration, Masaryk University in Brno, Czech Republic. This year's conference focused especially on the current issues related to financial markets, accounting, banking sector, insurance, financial literacy, financial law, different tax systems, corporate finance, international finance, public finance and financing of non-profit organizations.

Since the collection of papers presents the latest scientific knowledge in this area, I believe you will get a number of new insights usable for your scientific, educational and practical activities.

I wish you pleasant reading!

Eva Vávrová

Chairwoman of the Program Committee

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Contextual Non-financial Information Analysis of Annual Reports

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Abstract: *When assessing a firm's current and future financial performance, various information sources are available to interested parties. Annual reports, within which companies reveal their activities, results, developments and trends, are one of the most important information sources. Such a report contains, alongside financial data, narrative disclosure of contextual non-financial information providing broader insight into a company´s business and performance. With the increasing average length of narratives in recent years we may also observe the growing interest of investors or analysts in information revealed here as a means of supporting their decisions. The aim of this paper is to accept or reject the claims that non-financial "narrative" data could also be used for the assessment of the financial position and financial performance of a company. Our study confirms the assumption that qualitative data expressed in annual report narratives preceded change in quantitative financial data, and therefore could be used for the prediction of company financial performance. However, as qualitative and quantitative data complement and support each other they should be considered simultaneously by the annual report users, in order for them to be able to make the right decisions. Ergo, we recommend that investors and other annual report users examine narratives alongside individual financial situations and other information sources, in order to get a complete picture of the potential future developments of a company's financial performance. This would consequently contribute to their ability to make the right investment decisions and enable them to appraise the value of their funds.*

Keywords: sentiment analysis, annual report, narrative data

JEL codes: M49

1 Introduction

Some authors (Magnusson, 2005; Hajek et al., 2014) emphasize the importance of annual report narratives in financial performance forecasting. They argue that whilst financial data reflects the current financial situation of the company, the qualitative

data reflects the plans, future trends and expectations of management. Thus, changes in qualitative data might cause changes in financial figures into the future. This paper examines the validity of this argument through the textual analysis of report narratives. The main focus is placed on the forecasting accuracy of sentiment information; however textual complexity and thematic content analysis is also analyzed.

As previously stated, narrative reporting supplements and complements financial statements with prospective and retrospective information concerning various domains, including risk and uncertainties, economic and operating performance, strategy and structure, innovations, supply chain, corporate governance or environmental, social, and ethical performance. Sajjad (2011, p. 3) from ACCA expressed: "Reporting has moved beyond historically focused, number- driven content, [...] annual reports (have moved from their original focus on financial performance to a new emphasis on business performance." This has created new challenges requiring financial professional preparing reports to develop new skills and knowledge necessary to provide a reader the relevant and proportionate narrative information accompanying the financial data.

"Although investors, to a certain extent, make their decision on the basis of factual information such as income statement, cash-flow statements or balance sheet analysis, there is an important part of their decision which is based on a subjective evaluation of events surrounding the activities of a company (Ahmad, 2011, p. 101). Thus, textual information can also influence the decision-making process of corporate stakeholders.

In addition to this, narrative reporting provides important information which needs to be taken into account to fully understand the performance of a given company. According to Beattie et al. (2004, p. 222) quantitative financial information represents only about 20% of all information contained in annual reports.

Also, financial analysts acknowledged the usefulness of narrative reporting, with more than 80% of them identifying management discussion of corporate performance as extremely important or very important when assessing firm value (Balakrishnan et al., 2010, p. 791). Thus, it is imperative to dually consider both the analysis of textual information as it is financial data analysis, in order to be able to correctly assess a firm's financial performance.

2 Methodology and Data

Building on theoretical perspectives regarding the predictive power of annual report narratives, we examined whether the tone employed in annual report narratives, as well as textual complexity and structure, could indicate the worsening financial performance of a company in the near future. (Tumpach et al., 2014*)* Based on our findings, we assessed the usefulness of annual report narratives as a tool to support the decision-making process. The result would, therefore, have implications for investors (when making their investment decisions), analysts and other annual report users.

We particularly explored the narrative disclosure in the Management Discussion and Analysis section in the annual report in which managers comment on actual financial performance, and then make statements about future trends, development and challenges. Therefore, the information contained in this section is most likely to indicate potential future financial problems (Pakšiová et al., 2016). Alongside the tone employed by managers in narrative reporting, we examined the textual complexity and impression tactics which the management of the company may use in order to obfuscate bad news. We further analyzed the application of the so-called "Pollyanna hypothesis" which suggests that a company employs more positive and affirmative words in its disclosures, regardless of its financial performance.

We formulated and tested four main hypotheses:

H1: Financially distressed companies use a different tone of language in their annual reports (e.g. less positive, more uncertain) compared to the financially stable companies.

H2: Annual reports of financially distressed companies are more complex and difficult to read compared to those of companies with good financial health.

H3: With approaching bankruptcy, the tone of language employed in the annual report is likely to change (e.g. to become less positive, more uncertain).

H4: With approaching bankruptcy, the annual report text becomes more complex and difficult to read.

H5: With approaching bankruptcy, companies tend to employ various impression management tactics (e.g. using more passive forms) in order to obfuscate bad news.

We analyzed annual reports of companies divided into two groups based on Altman's bankruptcy prediction model: financially distressed companies likely to go bankrupt within the following two years and financially stable companies with a high probability of surviving (Ondrušová, 2016). This model proposed bankruptcy based on financial ratios reflecting current financial results (Blahušiaková, 2017). We examined whether the qualitative information contained in annual report narratives indicated bankruptcy alongside this quantitative information. Thus, we analyzed whether companies likely to go bankrupt employed a different tone of language and had various levels of reading ease difficulty compared to financially stable companies.

For this purpose, we selected 20 companies out of the Fortune 1000 list (Fortune, 2016). We divided them into two equal groups according to Altman's Z-score obtained from the Factiva database portal. This portal provides access to business-critical information including the Z- score calculation. Further, in order to obtain the data, we collected annual reports, 10-K filings, of U.S. companies from the EDGAR database (EDGAR, 2016). In total, we examined 20 Management Discussion and Analysis sections from the fiscal year 2015.

To assess the sentiment used in annual report narratives, we processed and analyzed this data with the LIWC2015 (Linguistic Inquiry and Word Count, Pennebaker et al., 2015) textual analysis program. This program analyzes text on various sentiment categories, including positive emotions, negative emotions, certainty, risk focus and others. To assess the textual complexity expressed by reading ease difficulty, the Flesch Reading Ease Formula, which considers the number of syllables per word and number of words per sentence, was used. The calculation of the Flesch Reading Ease Score and Flesch Kincaid Grade Level was conducted via a computer-assisted program available online (Readability-score.com).

Each company was analyzed individually on sentiment categories and readability, and the results obtained were subsequently synthesized. The results are presented in graphical forms where the aggregated data of financially distressed companies are compared against the aggregated data of financially stable companies. Based on these findings, we assessed the differences between the categories analyzed across both groups of companies. Thus, they indicated to us whether the relationship between sentiment in annual reports and the company's future financial performance exists. If so, we might assume that the sentiment and/or complexity of annual report narratives are able to predict the approaching bankruptcy in a similar way to the quantitative information expressed by Altman's Z-score.

However, Altman's Z-score prediction model does not provide absolute accuracy in bankruptcy prediction (Parajka, 2016). Therefore, in the second section, we selected one particular company which already had experienced bankruptcy. With this company, we analyzed whether the structure of the language used in narrative reporting changed over time alongside the changing financial performance. For these purposes we divided

companies into two groups – companies that belong to sage zone and companies that belong to distress zone.

We analyzed textual complexity through the Flesch Reading Ease Score employing the computer-assisted program (Readability-score.com). We also explored whether impression management tactics had been used to obfuscate adverse information in the annual report from the year preceding the bankruptcy.

We compared the results obtained in this analysis with the previous section results in order to be able to propose more reliable recommendations and conclusions. The actual conclusions regarding the usefulness of annual report narratives in financial performance prediction and, thus, their applicability in the decision-making process of users are further discussed below.

3 Results and Discussion

We will examine whether managers of analyzed companies employed methods mentioned above in the MD&A sections of annual reports more intensively prior to bankruptcy in relation to a negative information announcement. We will particularly focus on the parts when managers discuss "Significant Activities and Events and Items Influencing Future Performance" and "Key Risks and Challenges" revealing information about the main challenges companies faced which would have material effects on the results of operations, liquidity and financial condition, as well as initiatives undertaken to handle them. Therefore, if managers already had some knowledge about approaching bankruptcy, the signal about it will be most likely detected by analyzing these particular sections.

a) Reading Ease manipulation

Firstly, we assess the reading ease manipulation used in the text. Our previous findings already confirm that, based on the Flesch Reading Ease score, the text seems to be more complex and therefore more difficult to be read and understood closely before a bankruptcy announcement. By examining the text of this specific section of MD&A from one year before bankruptcy was revealed, we found some very difficult sentences which were in favor of prior findings. For example, MD&A section of EFH includes these main parts: Business Overview and Operational Segments; Key Risks and Challenges; Application of Critical Accounting Policies; Results of Operations; and Financial Condition about substantial leverage, one of the companies expressed their worries about liquidity constraints, through this difficult sentence composed of 73 words:

"While traditional counterparties with physical assets to hedge, as well as financial institutions and other parties, continue to participate in the markets, low natural gas and wholesale electricity prices, continued market and regulatory uncertainty and our liquidity and upcoming debt maturities have limited our hedging and trading activities, particularly for longer- dated transactions, which could impact our ability to hedge our commodity price and interest rate exposure to desired levels at reasonable costs."

Similarly, the sentence composed of 75 words appeared in relation to liquidity constraints, just a few sentences below the previous one.

"Further, a continuation, or further decline, of current forward natural gas prices could result in further declines in the values of TCEH's nuclear and lignite/coal-fueled generation assets and limit or hinder TCEH's ability to hedge its wholesale electricity revenues at sufficient price levels to support its significant interest payments and debt maturities, which could adversely impact TCEH's ability to obtain additional liquidity and refinance and/or extend the maturities of its outstanding debt."

Therefore, it is likely that such complex and difficult sentences may have negatively affected the reader's ability to fully comprehend some passages of the text. As a result, he/she may be inclined to terminate or skip some passages of the report. In this

case, we might suppose that managers would not like the reader to focus on liquidity constraints and substantial company leverage, but rather skip to the other passages which were written in a less complex way. This issue was also examined in a study of Courtis (2004) who suggested that readability variability should be considered alongside the Flesch reading ease score, in order to get the full picture about managers' efforts to deliberately make some information opaque. Thus, we compared the section Key Risk and Challenges with other parts of MD&A, and as a result we found significant differences in reading difficulty. The sections such as Business Overview and Results of Operations ranked comparably better on readability than Key Risks and Challenges (Flesch Reading Ease scores of the former two parts are 30.3 and 37, while the latter scored only 19.8). Results obtained from analysis through the readability computer-assisted program are available online on https://readability-score.com/.

b) Rhetorical manipulation and attribution

Secondly, we analyzed the rhetorical manipulation used within the text. Rhetorical manipulation includes use of linguistic devices such as pronouns and the passive voice in order to conceal negative news. We assumed that passive construction was used more often to deny responsibility for negative performance and that managers would attempt to dissociate themselves from negative news, therefore avoiding the statement of ownership.

Our analysis confirmed that in most of the cases managers employ passive language more often in connection with possible future negative outcomes. They would rather assign the responsibility for this negative news to other forces external to the company or employ techniques of impersonalization. Impersonalisation excludes or obfuscates social agents, thus representing processes in a more abstract manner. Examples of such employment of passive constructions were as follows:

- "...cash flows targeted under the natural gas price hedging program may not be achieved;" instead of expressing "We [EFH] might not achieve the targeted cash flows."

-"...certain amounts of TCEH unsecured debt maturing prior to 2017 are not refinanced;" instead of saying "We [EFH] will not refinance certain amounts of TCEH unsecured debt maturing prior to 2017."

- "Our ability to economically access the capital or credit markets could be restricted at a time when we would like, or need, to access those markets;" instead of expressing "We [EFH] might not be able to economically access the capital ..."

- "...the unfavorable impact on pretax earnings is estimated ... to be approximately

$1.5 million per day;" rather than "We [EFH] estimate that we will experience an unfavorable impact on pretax earnings."

- "...it is not possible to predict [...] the actual gains or losses that will ultimately be realized;" rather than "Based on the information available, we [EFH] are not able to predict [...] the actual gains or losses that EFH will ultimately realize."

On the other hand, managers employed active language and assigned possible positive outcomes to the company, and/or their own actions and initiatives. For example, speaking about issues of liquidity concern and the ability to meet obligations in the future:

- "...We expect that TCEH [Texas Competitive Electric Holdings Company LLC] will have sufficient liquidity to meets its obligations until October 2014."

Other examples of where managers associated themselves and their actions with the progress their company made, or the actions they took in order to achieve better performance, are as follows:

- "We implemented a liability management program designed to reduce debt;" rather than "A liability management program designed to reduce debt has been implemented."

- "We secured an extension of the maturity date," and "We secured the extension of the entire $2.05 billion of commitments;" rather than "The extension of the maturity date and entire commitments..." However, they continued with negative news and employed passive language: "Notwithstanding the extension, the maturity could be reset to an earlier date under a "springing maturity" provision if, as of a defined date, certain amounts of TCEH unsecured debt maturing prior to 2017 are not refinanced and TCEH's debt to Adjusted EBITDA ratio exceeds 6.00 to 1.00."

However, despite these findings confirming the application of passive language mainly in the context when managers try to avoid responsibility for negative outcomes, there were certain sentences within the text where this rule did not apply. For example, in the phrase "the natural gas price hedging program is designed to mitigate the effect on earnings oflow wholesale electricity prices." In this sentence the passive formulation was used even though the hedging program was a good initiative taken by the company. Later on, in the MD&A disclosure, the same idea was expressed, however this time it was formulated using an active construction: "We have implemented a natural gas price hedging program to mitigate the risk of lower wholesale electricity prices."

Texas Competitive Electric Holdings Company LLC is an indirect subsidiary of EFH Corp. To this end, it was also interesting to mention how managers started the description of the company's business in the opening sentence of the annual reports MD&A section. In the annual report from fiscal year 2012 (the year before its bankruptcy was announced) the managers expressed:

"EFH Corp., a Texas corporation, is a Dallas-based holding company that conducts its operations principally through its TCEH and Oncor subsidiaries."

Similarly, the same phrase was employed in annual reports from fiscal years 2008, 2011 and 2013. However, the opening sentence of the annual report from 2009 stated: "We are a Dallas-based holding company conducting operations principally through our TCEH and Oncor subsidiaries."

As mentioned above year 2009 was the only year from five years analyzed in which the company reported a net profit. Thus, according to this statement, it seemed that managers sought to associate themselves with the profitable company and its positive performance. However, they remained more neutral and attempted to dissociate themselves from company operations when its financial performance began to worsen.

c) Thematic manipulation

Thematic manipulation means that managers aimed to present financial performance in the best possible way by employing predominantly positive language and emphasizing positive outcomes. Whether companies utilized more positive and affirmative words in their MD&A disclosures was tested. As a result of analysis, the phenomenon called the Pollyanna principle was confirmed. Even though in 2012 the company used fewer positive words compared to other years examined, their volume and frequency within the text still significantly exceeds negative ones (3.06 vs. 1.29 percent).

Even solely within the sections "Significant Activities and Events and Items Influencing Future Performance" and "Key Risks and Challenges" where managers discussed the main challenges and threats to the company's business in the future, positive emotions prevailed over negative ones (2.89 vs. 1.27 percent). This was due to the fact that even though managers mentioned the main risks which threatened the company operations and financial situation, they discussed at the same time the initiatives taken

to address these challenges in the most effective way. Thus, they might place much more emphasis on these actions taken and the good results they could potentially bring, rather than only on the risks themselves. They attempt to reassure the reader of the company's strong performance in the future, despite the fact that some problems may have already threatened its financial situation.

For example:

- "...management continues to focus on the safe, reliable and efficient operations"

- "We believe these risks [that Oncor's credit ratings might have declined which would have affected its access to capital markets and the cost of debt] are substantially mitigated by the significant ring-fencing measures implemented by EFH Corp. and Oncor."

The latter statement was used to reassure the reader that any adverse action with respect to Oncor's credit ratings, which would generally cause borrowing costs to increase, was not likely to happen due to the adopted risk-fencing measures. However, only a few months after that report was filed "Moody's downgraded the senior secured rating of Oncor Electric Delivery Company (Oncor) to BAA2 from BAA1" (Moody´s Investor Service, 2012b).

Therefore, when we assessed the usefulness of annual report narratives in predicting a company's bankruptcy or change in financial performance in the near future, we needed to bear in mind that the positive, affirmative words would always prevail over the negative ones and treat that fact with caution.

In our study we compared the readability of companies which are in danger of bankruptcy and companies with a high probability to survive. To calculate the scores, we employed a computer assisted program available online (Readability-score.com) as processing this data manually would be very difficult and time-consuming. We assumed that companies from the distress zone would have annual reports more difficult to read in accordance with the hypothesis that these companies will be more likely to mislead users or obfuscate bad news compared to the financially healthy companies. Table 1 illustrate the aggregated results for safe and distress company groups.

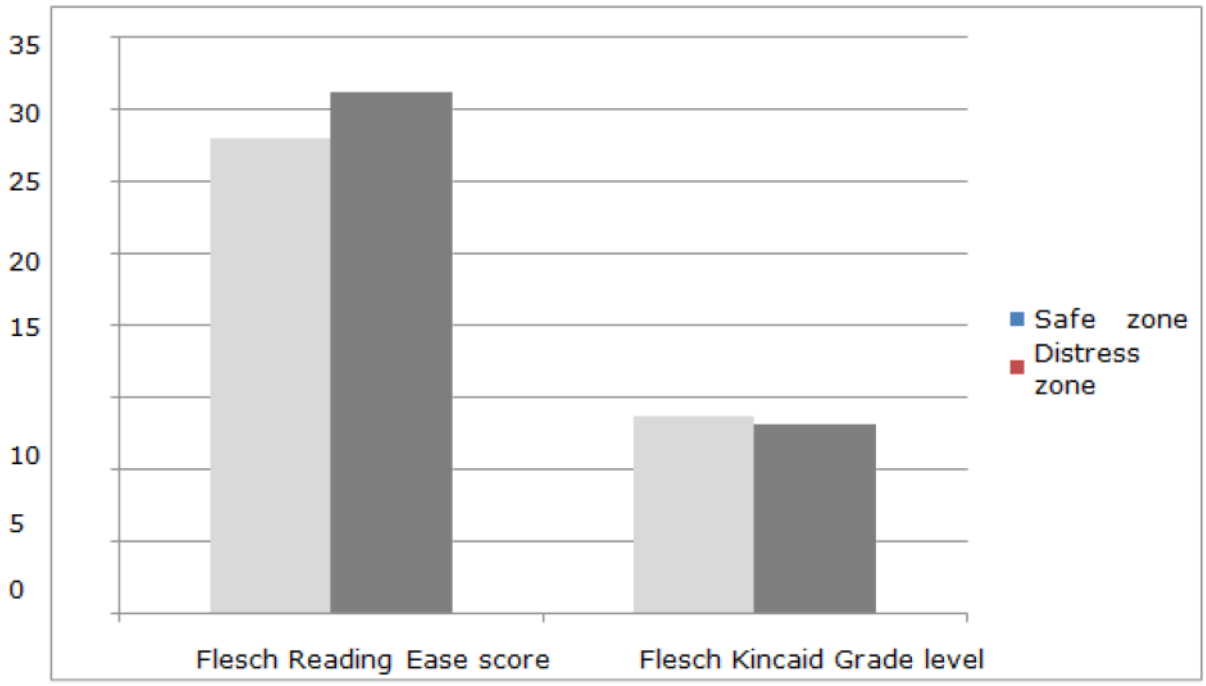
Table 1 Readability score determinants across safe and distress companies

	Safe zone	**Distress zone**
Word count	13 328,8	14 963,7
Sentence count	676	804,1
Syllable count	24 200	26 676,5
Words per sentence	20,13	19,3 7
Syllables per word	1,82	1,78
Characters per word	5,07	5,07

Source: Data obtained from EDGAR database, processed by www.readability-score.com

Table 1 provides the determinants needed to calculate the average level of readability score for each of two groups. On first sight, it seems that annual reports of safe zone companies will be easier to read as they contain fewer sentences as well as fewer words and syllables in total, but their sentences are composed of many more words and, similarly, the words contain many more syllables. This complexity makes their readability level more difficult.

Figure 1 Readability Scores Across Safe and Distress Companies



Source: Data obtained from EDGAR database, processed by www.readability-score.com

Figure 1 indicates that the MD&A section of both groups of companies is classified as difficult to read according to the Flesch Reading Ease Score because their score obtained ranges between 30 and 50. This finding is consistent with the general conclusion of other readability studies which classify corporate annual reports as difficult to very difficult to read (Beattie et al., 2004, p. 212).

Interestingly, our finding rejected the hypothesis that companies closer to bankruptcy use a more complex and difficult writing style than companies likely to survive. On the contrary, it indicated that distressed companies' MD&A sections are, in general, easier to read and be understood by the user compared to the other group. Within both groups, there are two companies which are classified as very difficult to read[19] but on average, both distressed and safe companies' MD&A are classified as difficult (distress zone with the score 36.14, and safe zone with the score 33.01).

Previous studies found that firms with lower earnings or less profitable companies tend to file annual reports which are more difficult to read than the firms which are performing well as the managers are more likely to obfuscate information concerning poor performance (Li, 2008). However, our findings are totally inconsistent with this argument as well. When we deeper examined the distressed companies and divided them, according to current earnings, as profitable and unprofitable, we found that companies which reported a loss in fiscal year 2015 ranked actually better on the reading ease score (38.4) than the profitable ones (34.7).

Based on results obtained, we concluded that our analysis does not confirm hypothesis 2. Annual reports of companies with possible financial problems are not found to be more difficult to read compared to companies which perform well. As no relationship between these two variables [financial performance and readability] was found, we would not recommend the readability score as the indicator used to predict the financial performance of the company according to these findings.

4 Conclusions

The annual report is not only a compulsory document and communication tool between a company and its shareholders, but also a way for a company to present itself in terms of information openness and transparency. The financial data contained in annual reports are important indicators of current financial performance and may also indicate future financial development via the application of prediction models such as Altman´s Z- score. However, they do not provide us with insight into all of the circumstances that led to these results, nor do they give information about future trends, development and managers' expectations. For this purpose, qualitative data is especially useful.

Narrative reporting supplements and complements financial statements with prospective and retrospective information concerning various domains, including risk and uncertainties, economic and operating performance. With the increasing average length of narratives in recent years, we may also observe the growing interest of investors and other users in this information. For example, financial analysts acknowledged the usefulness of narrative reporting, when as many, or more than 80% of them identified management discussion of corporate performance as extremely important or very important when assessing firm value (Balakrishnan et al., 2010, p. 791).

Although annual report narratives are more subjective than financial data, we suggest they may be indicative of future financial developments, as demonstrated by the language managers use to disclose information. In this study we used a combination of two textual analysis programs in order to accept or reject the claims that non-financial "narrative" data could also be used for the assessment of the financial position and financial performance of a company. Our analysis focused on the Management Discussion and Analysis section (MD&A) of the 10-K reports. Here managers comment on financial performance, but also express predictive statements about future trends, expectations and challenges. Therefore, the information contained in these sections is most likely to indicate future financial performance.

Besides the potential opportunistic behavior of the manager when constructing the language of annual report narratives, the results of our sentiment analysis supported the hypothesis that financially distressed companies use a different tone of language in their annual reports from those of financially stable companies (H1). Similarly, we found that the sentiment employed in annual reports changed when the analyzed company approached bankruptcy (H3). These findings confirmed the relationship between the tone which managers use in constructing annual report narratives, and the financial performance of the company. Thus, we suggest that annual report users pay more attention to this aspect of corporate disclosures, due to the fact it might reflect the future financial developments of the company.

However, concerning the readability analysis, we rejected our original hypothesis that annual reports of financially distressed companies are more complex and difficult to read compared to those with good financial health (H2). Interestingly, the research confirmed that when a company was approaching bankruptcy, the annual report text becomes more complex and difficult to read (H4). These two opposing findings ensured that we could not recognize textual complexity, measured by readability analysis, as a reliable and accurate prediction tool of a company's financial performance.

Our final hypothesis (H5), which suggests that companies tend to employ various impression management tactics in order to construct an inaccurate impression of organizational outcomes, and/or present an accurate but favorable view of organizational outcomes, was confirmed. In general, managers tended to deny responsibility for negative outcomes whilst taking credit for the positive ones. However, for this final hypothesis we examined only one annual report of a company one year prior to its bankruptcy. Therefore, we suggest further research would be appropriate in

this particular area, one means of which would be to examine a larger sample of companies.

In addition, we established the "Pollyanna principle," which suggests that companies tend to use positive, affirmative words more frequently than negative words in their reporting, regardless of corporate financial position. This finding is consistent with the results of previous studies conducted in this domain (Rutherford, 2005). In terms of textual complexity, we found that the MD&A section of most of the companies analyzed is classified as difficult to read according to the Flesch reading ease score. This finding is also consistent with other readability studies, which classify corporate annual reports as 'difficult to very difficult to read' (Beattie et al., 2004, p. 212).

However, the presented research has limitations which could subsequently affect the reliability and accuracy of the results achieved, and on which our recommendations are based. The appropriateness of the sentiment analysis software LIWC2015 as a general textual analysis program, and its applicability in financial and business domain was questioned. Also the Flesch readability formula has been criticized for a number of reasons, mainly due to its exclusive focus on word and sentence length. Other factors which could affect reading ease difficulty and the ability of the user to fully understand the text are ignored. Further, the sample analyzed consisted of a limited number of companies. As the differences between some sentiment categories have been only slightly observable, we remain uncertain if a different sample of twenty companies would deliver the same conclusions. Thus, we recommend examining a larger sample of companies in order to prove the validity of our findings. In spite of these limitations, we conclude that non-financial narrative data could be used for the assessment of financial positions and financial performance of a company.

Our study confirms the assumption that qualitative data expressed in annual report narratives preceded change in quantitative financial data, and therefore could be used for the prediction of company financial performance. However, as qualitative and quantitative data complement and support each other they should be considered simultaneously by the annual report users, in order for them to be able to make the right decisions. Ergo, we recommend that investors and other annual report users examine narratives alongside individual financial situations and other information sources, in order to get a complete picture of the potential future developments of a company's financial performance. This would consequently contribute to their ability to make the right investment decisions and enable them to appraise the value of their funds.

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