

Annual Report Readability And Corporate Bankruptcy

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ABSTRACT

This study investigates the relationship between a firm's annual report readability and its probability of bankruptcy. Findings show that firms with a larger 10-K file size have a higher probability of bankruptcy. More specifically, we suggest that there is a curvilinear relationship between annual report readability and bankruptcy probability. However, this relation is not significant for small firms. We further suggest that annual report readability has incremental power in predicting corporate bankruptcy. While prior accounting and finance research mainly used financial and accounting ratios as predictive variables of firm bankruptcy, we add a new non-financial predictive variable to these models.

Keywords: 10-K; Altman's Score; Annual Report; Bankruptcy Risk; Readability

JEL Classification: G14, G33

1. INTRODUCTION

Public companies are required to provide financial statement users with comprehensive information. The SEC (Securities and Exchange Commission) has responded to increasing calls for clear and comprehensive information by requiring companies to use plain English in their disclosure documents. At its inception in 1934, the Securities Exchange Act urged US firms to improve their disclosure quality. In 1995, the Report of the Task Force on Disclosure Simplification proposed several recommendations to improve disclosure quality, including enhancing the readability of reports.

By contrast, managers may perceive advantages in releasing incomprehensible annual reports. Prior literature indicates that managers make deliberate decisions to use vague or complex language (Li, 2008; Leavy, Feng & Merkley, 2011; Lo, Ramos & Rogo, 2017). According to Leavy et al. (2011), they opt either to send investors a clear signal with a readable disclosure or to confuse them with convoluted language in the 10-K form. Managers can use annual report readability as a strategic tool, especially when the firm is in financial distress, in which case they may choose to intentionally make the information unreadable in order to transmit a biased message. Their goal is to present the company as positively and optimistically as possible, for example by presenting biased information about company risk with the aim of influencing the investor's perception of the firm's financial situation.

Given the importance of the information content in the 10-K form and the SEC's concerns about investors' comprehension of this information, a legitimate question arises as to the report's impact on predictions of the firm's financial distress. Specifically, is there a relationship between annual report readability and readers' perceptions about the likelihood of firm bankruptcy?

This paper contributes to the literature in the following ways. First, given the widespread use of financial and accounting ratios as predictive variables in firm bankruptcy models (Beaver, 1966; Ohlson, 1980; Campbell, Hilscher & Szilagyi), our research adds a new non-financial predictive variable to these models. Second, we contribute to the literature on readability by examining the prevalence of the readability of annual reports as a strategic tool. Third, we use 10-K document file size as a measure of readability, as suggested by Loughran and McDonald, (2014) in their assertions that 10-K document file size offers a simple readability proxy that outperforms the Fog Index. Overall, our

paper adds to the vast literature on bankruptcy prediction by testing whether annual report readability has incremental power in predicting financial distress, and more specifically, corporate bankruptcy.

Based on a sample of 874 US firms (437 bankrupt firms matched to 437 non-bankrupt firms), our results suggest that bankrupt firms have less readable annual reports than non-bankrupt firms. In addition, annual report readability has incremental power in predicting financial distress, especially corporate bankruptcy.

The rest of the paper is organized as follows. In section 2, we discuss the literature relevant to annual report readability. Section 3 outlines the data and key variables. Section 4 investigates the relationship of readability and corporate bankruptcy. Section 5 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Prior studies on annual report readability compare firms with complicated versus understandable annual reports. In particular, they examine the association of readability with financial performance, earnings persistence, analyst forecasts' dispersion and the implications of readability (investors' reactions).

Accounting and financial studies on the readability of SEC filings were pioneered by Li (2008). A key finding of this research is that annual report readability is related to earnings persistence. Li (2008) suggests that 1) the annual reports of poorly performing firms are more difficult to read, and 2) firms with more readable annual reports have greater earnings persistence. However, Li (2008) admits that there are two alternative explanations to this finding, as discussed by Bloomfield (2008). According to both authors, firms may intentionally obfuscate bad information, and bad news is inherently more difficult to communicate.

Other studies show that shareholders of firms with poorly readable annual reports are confronted not only with insufficient disclosure transparency, imprecise information and increased external financial costs, but they must also deal with wasting time to find relevant information. In particular, Lehavy et al. (2011) show that less readable annual reports are associated with more analyst-forecast dispersion and less forecast accuracy. They suggest that the demand for analyst services increases with complicated 10-K filings. Biddle, Hilary & Verdi (2009) demonstrate that understandable reports reduce adverse selection and moral hazard. Miller (2010) suggests that complicated 10-K reports reduce consensus among small investors (but not large ones). You and Zhang (2009) suggest that markets' underreaction to 10-K filings increases as the report length grows. Lo, Ramos & Rogo, 2017, in a study of the relationship between annual report readability and earnings management, posit that 10-K readability has incremental power in predicting financial misstatements. Finally, Ertugrul, Lei, Qiu & Wan (2017) investigate the relationship between annual report readability and the firm's cost of borrowing and find a positive association between poor readability and future stock price crash risk, leading them to suggest that lack of transparent information results in increased external financing costs.

Overall, prior studies suggest that investors, particularly small investors, have greater difficulty interpreting and organizing the information in less readable 10-K report disclosures. Complicated reports require specific skills, more time, and greater effort to extract the most important information (Bloomfield, 2002). Additionally, the longer (and therefore the less readable) the annual report, the longer it takes for investors to find the relevant information.

Whereas previous studies on annual report readability show that managers tend to use low readability disclosures to obfuscate poor earnings performance (Li, 2008), the research is largely silent on the relationship between readability and corporate bankruptcy. Indeed, one question that arises from prior research on annual report readability is the following: if managers use annual report readability to influence investor sentiment and beliefs in regard to poorly performing firms, why not use it to reduce investors' perceptions about the possibility of corporate bankruptcy?

In our study, we hypothesize that managers choose complex financial disclosures to conceal cues about financial distress and confuse readers by drowning the information in lengthy 10-K reports. In light of the above discussion, our main hypothesis is:

H1: The annual reports of bankrupt firms are less readable than those of non-bankrupt firms.

3. DATA AND METHODOLOGY

3.1 Data

This study examines the link between annual report readability and corporate bankruptcy using corporate bankruptcy cases that occurred in the US between 1994 and 2009. We identified 590 US bankrupt firms from the UCLA-LoPucki Bankruptcy Research Database. From this initial sample, 153 firms were excluded due to lack of data (annual reports and matching firms not available). Thirty-one percent of the bankrupt firms in the resulting sample are in manufacturing, 18% in transportation and communication, 16% in finance and insurance and 14% in the service industry.

We collected annual report readability data and information on the firms' financial situation one year before the bankruptcy date. Each of the 437 bankrupt firms was matched with a non-bankrupt firm based on firm size, stock exchange, time period and industry (2-digit SIC). The resulting final sample totaled 874 US firms. To measure annual report readability, we used the file size indicated in the "complete submission text file" available on the SEC EDGAR website, as suggested by Loughran and McDonald (2014). Finally, we collected accounting data from Compustat.

3.2 Methodology

To examine the effect of annual report readability on firm bankruptcy, we conducted univariate and multivariate analyses and estimated the following regression to test our first hypothesis:

$$\text{Bankruptcy} = f(\text{readability}, \text{control variables})$$

Appendix A presents a description of the study's variables. Our dependent variable is the probability of bankruptcy. This variable takes the value of 1 if the firm is in bankruptcy and 0 otherwise. Our independent variable measures annual report readability. We use 10-K file size as a measure of readability, which is shown by Loughran and McDonald (2014) to be more relevant and robust as a measure of readability in financial disclosure than the Fog index. Business texts contain more complex words than other types of documents; however, the Fog index even treats *company*, a word very familiar word to investors, as a complex word. Loughran and McDonald (2014) show that investors find shorter annual reports more informative, and they therefore encourage accounting and financial researchers to use the 10-K size rather than the Fog index.

Given that the SEC prescribes a minimum level of readability and the use of plain English, we test the existence of a curvilinear relationship between report size and probability of bankruptcy by adding the squared FILESIZE to our model.

Consistent with bankruptcy literature, we control for several variables deemed to affect the probability of bankruptcy, including return on assets (ROA). We thus expect that ROA affects negatively the probability of bankruptcy (Altman 1968; Ohlson 1980). In fact, accounting variables (sales to total assets, earnings before interest and taxes to total assets, etc.) were traditionally used to develop bankruptcy forecast models in earlier studies (Beaver, 1966; Altman, 1968; Ohlson, 1980). Recently, Tian, Yu & Guo (2015) examined the relative importance of various commonly used variables to predict bankruptcy. Their results suggest that accounting variables outperform market variables, and their performance increases with prediction horizons.

We also include cash asset ratio (cash/total assets) and debt ratio (total liabilities/total assets), as previous research has done (Deakin, 1972; Tian et al. 2015). In line with those studies, we expect to see a positive relationship between debt ratio and probability of bankruptcy. We control for cash asset ratio and total assets as suggested, and lastly, control for the Altman's Z-Score (Altman, 1968).

4. RESULTS

Table 1 presents the main descriptive statistics of our variables. Our sample includes 874 firms we classified as 437 bankrupt firms and 437 non-bankrupt firms. The average log file size of bankrupt firms is 14 compared to 13.79 for non-bankrupt firms. The difference is significant between these two samples. As reported in previous studies, bankrupt firms have poor financial performance. The average ROA for bankrupt firms is -0.232 compared to 0.030 for non-bankrupt firms. There are significant differences between the two samples for the cash to asset ratio and debt ratio.

Table 1. Descriptive Statistics

	Total Sample		Bankrupt Firms		Non-bankrupt Firms		t Stat
	Mean	SD	Mean	SD	Mean	SD	
FILESIZE	13.900	1.284	14.005	1.192	13.795	1.363	-2.838***
ASSETS	6.658	1.217	6.679	1.204	6.636	1.231	-0.333
ROA	- 0.099	.645	- 0.232	0.410	0.030	0.791	12.838***
LTAT	0.403	1.295	0.403	0.384	0.402	1.764	-2.524**
CASHAT	0.094	.578	0.060	0.081	0.128	0.808	0.684**

*, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

Appendix B presents the matrix correlations between variables. We note that FILESIZE is positively correlated with ASSETS and negatively with ROA.

Table 2 presents the results of logit regressions of bankruptcy probability on annual report readability and control variables. Table 2, column 1 tests our model, column 2 tests the curvilinear relation between annual report readability and bankruptcy probability, and column 3 adds the ALTMAN variable to the model. Overall, results show that bankruptcy probability and 10-K file size are positively and significantly associated, a finding that supports our hypothesis that bankrupt firms' annual reports are less readable than those of matching firms, that managers in financially distressed firms choose to confuse investors with too much information, and that they deliberately make reports unreadable to convey a biased or unclear message. These findings support the conclusion that managers make a conscious decision about using complex and incomprehensible language in annual reports (Li, 2008; Leheavy, et al. 2011; Lo, Ramos & Rogo, 2017). We find that readability is one of the strategic tools they use to confuse investors with regard to the firm's financial situation. Our findings contribute to the literature on bankruptcy by developing a new measure to assess annual report readability as a predictor of financial distress.

In addition, we show that there is a curvilinear relation between annual report readability and bankruptcy probability. This finding supports the premise that the 10-K file has a bounded effect on financial distress. Lastly, column 3 shows that the Altman's score has less predictive power than 10-K file size.

Table 2. Logit Regressions

Variables	(1)	(2)	(3)
FILESIZE	0.272^{***} 2.60	6.714^{***} 2.65	5.843^{**} 2.05
FILESIZE ²		-0.236^{**} -2.54	-0.211^{**} -2.03
ALTMAN			-0.247 -1.54
ROA	-2.946^{***} -6.10	-2.804^{***} -3.33	-1.967[*] -1.72
CASHAT	-3.136^{***} -2.72	-3.004^{**} -2.05	-4.543^{**} -2.52
LTAT	0.584[*] 1.82	0.594^{**} 2.01	-0.395 -0.71
Constant	-3.987^{***} -2.82	-47.590^{***} -2.77	-39.51^{**} -2.03
Wald χ^2	34.94	43.96	28.05
Prob > χ^2	0.000	0.000	0.000
Pseudo R ²	0.129	0.139	0.222
Correctly classified	70.53%	70.33%	78.29%

*, ** and *** denote significance at the 10%, 5% and 1% levels respectively

Results of logit regressions of the probability of bankruptcy on 10-K file size and control variables are shown. See Appendix A for variable definitions.

To check the robustness of our analysis, we divide our sample into four subsamples based on the quartile of the size of total assets. We examine if the relationship between readability and bankruptcy remains unchanged for all subsamples. Results reported in Table 3 indicate that the coefficient of FILESIZE is not significant for the smallest firms.

Table 3. Logit Regressions By Subsample

Variables	Portfolio 1 25% min	Portfolio 2	Portfolio 3	Portfolio 4 25% max
FILESIZE	-2.995 -0.66	12.019^{**} 2.09	18.187^{***} 2.56	10.601[*] 1.77
FILESIZE ²	0.127 0.72	-0.437^{**} -2.06	-0.667^{**} -2.54	-0.367[*] -1.71
ROA	-2.214^{**} -2.50	-4.182^{***} -2.97	-4.005^{**} -2.33	-1.571 -1.59
CASHAT	-5.666^{**} -2.38	-1.552 -0.60	1.256 0.37	-8.180^{**} -2.22
LTAT	0.853 1.22	0.668 1.3	0.265 0.37	0.663 1.01
Constant	16.99 0.58	-123.94^{***} 0.37	-82.670^{**} -2.13	-75.790[*] -1.83
Wald χ^2	12.67^{**}	20.71^{***}	17.67^{***}	14.14^{***}
Prob > χ^2	0.026	0.000	0.003	0.014
Pseudo R ²	0.166	0.208	0.186	0.113
Correctly classified	73.04%	71.97%	76.23%	67.48%

*, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

Results of logit regressions of the probability of bankruptcy on 10-K file size and control variables are shown. See Appendix A for variable definitions. *, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

5. CONCLUSION

This study examines the relationship of annual report readability and the probability of bankruptcy. We argue that bankrupt firms have less readable annual reports than non-bankrupt firms. As suggested by Loughran and McDonald (2014), we use 10-K file size to measure annual report readability. After controlling for several variables, our results show that the 10-K file size for bankrupt firms is larger than for non-bankrupt firms. Based on a sample of 874 US firms, we provide evidence that annual report readability has incremental power in predicting financial distress, especially corporate bankruptcy.

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APPENDICIES

Appendix A. Variables Description

Variable	Sign	Description
Bankruptcy		Equals 1 if the firm is in bankruptcy and 0 otherwise
FILESIZE	+	Natural logarithm of the file size (in megabytes) indicated with the SEC EDGAR “complete submission text file” for the 10-K filing
FILESIZE ²	-	Square of the natural logarithm of the file size indicated with the SEC EDGAR “complete submission text file” for the 10-K filing
ASSETS	+/-	Natural logarithm of Total assets
ROA	-	Net income /Total assets
CASH	-	Cash/Total assets
LTAT	+	Total liabilities/Total assets
ALTMAN		Altman’s Z-score (Altman 1968)

Appendix B. Matrix Correlations

	FILESIZE	ASSETS	ROA	CASHAT	LTAT
FILESIZE	1.000				
ASSETS	0.230*** 0.000	1.000			
ROA	-0.150*** 0.008	0.027 0.537	1.000		
CASHAT	0.042 0.591	-0.090** 0.043	-0.022 0.613	1.000	
LTAT	0.060 0.178	0.020 0.642	-0.123*** 0.000	-0.309*** 0.000	1.000

*, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

NOTES