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Whether Social Media Negative Emotion Could Forecast the Risk of Enterprise Finance: Evidence from Baidu Tieba

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Abstract:

In the context of the current era, as a new form of information dissemination, social media has penetrated into every field of people's life, and its impact on the financial industry has also attracted more and more scholars' attention. From the perspective of social media, this paper focuses on the impact and prediction of negative emotions reflected by social media on corporate financial risk. In this paper, Pearson correlation coefficient is used for correlation analysis, and a linear regression model is built to analyze the relationship between negative social media and corporate finance. The results show that enterprises and investors can judge the financial risks of enterprises through the negative emotions of social media, thus reducing the losses of enterprises and investors. The conclusions of this study can improve the risk avoidance ability of enterprises to avoid negative emotions on social media, and provide important reference value for future operations.

Keywords: Enterprise financial risk; Risk prediction; Negative emotions on social media; Correlation analysis; Analysis of regression.

1. Introduction

1.1 Research Background and Significance

With the continuous development of network technology, people have more and more diversified ways to obtain information, and the traditional way of information transmission has been gradually replaced by the new situation. As a new paradigm, social media promotes the dissemination of information in social networks, breaks the monopoly of traditional media on information, and provides an open and convenient channel for public emotional expression [1,2]. Reduce the cost of investor information collection. In the financial market, the trend of stock prices is subject to a large number of news from different sources on the Internet, among which the rapid spread of negative emotions on social media may have an impact on the finance and stock price of enterprises. The stronger the negative emotions of investors towards enterprises, the more likely it is that mass public opinion events will be formed through online news media. Thus, the probability of administrative punishment for listed companies will be increased [3,4]. Therefore, from the perspective of social media, this paper aims to analyze the relationship between negative emotions reflected by social media and corporate financial risks, and importantly explore the correlation and prediction ability of the two. This study hopes to prove the correlation between negative emotions of social media and financial risks of enterprises to help investors and enterprises predict financial risks and reduce losses, which has important practical significance for investors' market decision-making.

1.2 Literature Review

As the Internet has gradually entered our lives, researchers have also begun to study the information on the Internet. Related studies, such as the impact of enterprises' use of social media on venture capital investment decisions, prove that venture capital shows a low willingness to cooperate when investing in enterprises with high participation in social media [5]. Other studies investigated the annual reports of enterprises with credit risks to verify the relationship between the degree of pessimism and enterprise credit risks [6]. In addition, through the study of media tone reported by mainstream financial media on IPO companies before listing, it is concluded that companies and underwriters have the motivation to promote IPO companies through media to incite and guide investor sentiment, which proves the reliability of media tone as a proxy variable of investor sentiment [7]. However, due to

the large amount of information in the Internet, the diversity of research perspectives of researchers, and the difference in the selection of research data and analysis methods, previous studies have obvious differences in results, so there are limitations in the research in this field. Based on this, this paper explores the relationship between negative social media emotions and corporate financial risk prediction, and explains the correlation between the two.

1.3 Research Contents

The main research content of this study is whether investor sentiment is related to corporate financial risk, and whether investor sentiment on social media can predict corporate financial risk. To study this content, this study collects the number of bearish posts of enterprises in Baidu Tieba, and then collects the z-score and revenue growth rate of enterprises, and adopts Pearson correlation coefficient to conduct correlation analysis and unitary linear regression formula to conduct regression analysis.

2. Empirical Analysis

2.1 Data Selection and Source

In order to study the relationship between negative emotions of social media and financial risks of enterprises, the data of CSMAR database of Guotai 'an from May 2023 to May 2024 are selected in this paper, and the data frequency is daily data. In order to obtain investors' negative sentiment towards enterprises, the number of bearish posts was selected as the independent variable of the study, and Z score was selected as the dependent variable [8,9]. After screening the samples, 20,431 sets of valid data were obtained. This paper chooses the revenue growth rate as the control variable [10].

2.2 Descriptive Statistical Analysis

Descriptive statistical analysis is used to validate the collected data. This paper describes and analyzes the overall situation of the sample through the statistics of business risk, stock risk and investor sentiment. The details are shown in Table 1.

Table 1. Descriptive statistics of variables

	N	Minimum Value	Maximum Vale	Mean Vale	Standard Deviation	Variance
Business Risk	20792	-22.58	168.86	4.56	6.92	47.85
Equity Risk	987537	-1666.36	4955.99	-1.20	56.50	3192.52
Investor Sentiment Statics	1000000	0	477	1.06	5.79	33.470
Number of Valid Cases(In rows)	20431					

In this paper, SPSS26.0 software was used to conduct descriptive statistics on role pressure, job engagement and organizational identity, and the results were shown in Table 1. The average score for the operating risk variable is 4.558, the stock risk score is -1.200, and the statistical average of investor sentiment is 1.06.

2.3 Correlation Analysis

Correlation analysis is a statistical analysis method used to describe the correlation between two or more variables, which can be used to understand the correlation properties between variables. This article uses SPSS 26.0 for operation. The details are shown in Table 2.

Table 2. Correlation analysis

		Business Risk	Equity Risk	Investor Sentiment Statics
Pearson Correlation	Business Risk	1.000		
	Equity Risk	0.61	1.000	
	Investor Sentiment Statics	-0.015	-0.105	1.000
Significance (One-sided)	Business Risk	0.0		
	Equity Risk	0.009**	0.0	
	Investor Sentiment Statics	0.017*	0.000**	0.0

Number of Case	Business Risk	20431	20431	20431
	Equity Risk	20431	20431	20431
	Investor Sentiment Statics	20431	20431	20431

Note:*,** represents significant at 0.05 and 0.01 levels, respectively.

This paper chooses Pearson correlation analysis method. The value range of correlation coefficient is between [-1,1]. When r>0, it indicates that there is a positive correlation between the two variables. When r<0, there is a negative correlation between the two variables. It is generally believed that the value of the correlation coefficient is described as follows: When |r|=1, it is perfectly correlated. When |r|≥0.8, the correlation was high correlation. When 0.5≤|r| < 0.8, the correlation was moderate. When |r| < 0.5, the correlation was low correlation. This paper studies the influence of business risk, stock risk and investor sentiment. As can be seen from Table 2: First, there is a significant positive correlation between business risk and stock risk. Third, stock risk has a significant negative correlation with investor sentiment.

2.4 Model Setting

Pearson correlation analysis was used in this paper. The formula is:

$$r = \frac{\sum (x_i - x)(y_i - y)}{\sqrt{\sum (x_i -)^2 \sum (y_i - y)^2}} \quad (1)$$

3. Regression Analysis

Regression analysis refers to the interdependence between two or more variables. This paper takes investor sentiment as independent variable and business risk as dependent variable. The variables of Model 1 domain model 2 are different. The variables of Model 1 are stock risk, and the variables of model 2 are stock risk and investor sentiment statistics. The details are shown in Table 3.

Table 3. Linear-regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance	Collinearity Statistics	
		B	Standard Error	Beta			Allowance	VIF
1	(Constant)	4.569	0.050		91.857	0.000		
	Equity Risk	0.212	0.009	0.010	11.413	0.015	1.000	1.000
2	(Constant)	4.589	0.051		90.402	0.000		
	Equity Risk	0.210	0.009	0.008	4.195	0.032		
	Investor Sentiment Statics	-0.010	0.005	-0.014	-1.991	0.046		
Model Summary [c]								
Model		R^2	After the Adjustment R^2	Error in Standard Estimate		Durbin -Watson		F
1		0.50	0.51	6.939			56.102	
2		0.36	0.32	6.938		0.625	98.307	

a. Predictive Variable: (Constant), Equity Risk
b. Predictive Variable: (Constant), Equity Risk , Investor Sentiment Statics
c. Dependent Variable: Business Risk

As can be seen from the regression results in Table 3, both stock risk and investor sentiment are significantly correlated with business risk, in which stock risk is positively correlated with business risk, while investor sentiment is negatively correlated with business risk. Through the construction of models, this hierarchical regression analysis involves a total of 2 models. The independent variable in Model 1 is the independent variable stock risk, and Model 2 adds investor sentiment statistics on the basis of Model 1. Model 1: Its R2 of 0.50 means that the independent vari-

able can explain 50% of the change in the dependent variable: The model passes the F test, and VIF is less than 5, indicating that there is no collinearity problem in the model.

Model 2: Its R2 of 0.36 means that the independent variable can explain 36% of the variation in the dependent variable: The model passes the F test and VIF is less than 5, indicating that there is no collinearity problem in the model.

4. Conclusion

Through correlation analysis and regression analysis, this study analyzed and explained the relationship between negative social media emotions and corporate financial risk. According to the research, the correlation between the number of bearish posts and Z score is low. Regression analysis shows that stock risk is significantly correlated with investor sentiment and business risk.

This finding provides a new direction for subsequent research on social media and corporate financial risk. According to the research results of this paper, it is suggested that investors should pay attention to the number of negative emotions of other investors towards the enterprise through social media before choosing an enterprise for investment, so as to judge whether the enterprise has risks and whether it is worth investing, so as to reduce investment risks. Enterprises should also pay timely attention to the number of negative emotions displayed by investors on social media to judge whether there are financial risks of enterprises and reduce the business risks of enterprises.

This paper studies the relationship between social media and corporate financial risk from a single perspective, but there are limitations in the research perspective and methods. At present, there are few researches in this field, and the author hope to carry out more researches in this field in the future. To prove the relationship between the two from more perspectives.

References

[1] Stieglitz, S., & Dang-Xuan, L. Emotions and Information Diffusion in Social Media—Sentiment of Microblogs and Sharing Behavior. Journal of Management Information Systems, 2023, 29(4): 217–248.

[2] ERIKSSON M. Lessons for Crisis Communication on Social Media: A Systematic Review of What Research Tells the Practice.Int. J. Strat. Commun., 2018, (12): 526–551.

[3] Gary Ang and Ee-Peng Lim. Investment and Risk Management with Online News and Heterogeneous Networks. ACM Trans. 2023, 17, 24.

[4] Li Shigang. Negative emotions of small and medium-sized investors and auditor reactions: A study based on the opinions of small and medium-sized investors in stock forums. Contemporary Finance, 2020, (11) 124-137.

[5] Chen Wei, & Leng Fanglai. The impact of corporate social media participation on venture capital investment decisions: An empirical study based on Weibo data. Southern Finance, 2023, 1(4), 48-62.

[6] Zhang, H., Zhang, H., & Zhang, M. Research on Enterprise Credit Risk Prediction Based on Text Information. Journal of Risk Analysis and Crisis Response, 2022, 11(4).

[7] Wang Changyun, Wu Jiawei. (2015). Media Tone, Investor Sentiment and IPO Pricing. Journal of Financial Research,2022, 423(9): 174-189.

[8] Lu Jing, & Min Jian. Negative media sentiment, social responsibility and corporate risk-taking: Pressure-driven or loss-averse. Finance and Accounting Communications. 2021.

[9] Tao Ya. Analysis of financial risk warning of listed companies based on Z-score model: A case study of listed companies in Inner Mongolia. China Chief Accountant, 2012, (11), 56-58.

[10] Yang Xiaolan, Shen Hanbin, & Zhu Yu. Local preference, investor sentiment and stock returns: Empirical evidence from online forums. Financial Research, 2016, 438(12), 143-158.