

Does Weakening Exist? Positive Text Tone and the Negative Effect of Economic Policy Uncertainty on Corporate Debt Financing

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Abstract

From the perspective of economic policy uncertainty, this paper explores the relationship between corporate debt financing and the tone of text contained in relevant corporate text information. Based on the data from 2011 to 2018, it is found that economic policy uncertainty will inhibit the acquisition of new debt financing by enterprises. However, the positive tone of text information will convey to the lender company's current good operating conditions and the strengthening of risk control, which will enhance the lending confidence of loan institutions and can weaken the intensity of the above negative relationship. Meanwhile, according to the relevant research results of heterogeneity, it is found that compared with state-owned enterprises and enterprises with small asset scale, the weakening effect of the positive tone of text information is more significant in non-state-owned enterprises and enterprises with large asset scale.

Keywords

Economic Policy Uncertainty, Tone of Text Information, Debt Financing

1. Introduction

The smooth operation of production activities and the timely participation in quality investment projects require sufficient funds as support. The existence of tax saving effect of debt financing makes it favored by some enterprises and become an important source for enterprises to obtain funds. Loan institutions grant loans to enterprises that meet the criteria based on their own risk assessment mechanism, while enterprises which cannot meet relevant requirements often need to pay a high cost to obtain funds. The problem of difficult and ex-

pensive financing has always been a topic that cannot be solved by both lenders and borrowers, which puzzles enterprises.

In the process of resource allocation and economic operation, the market plays a decisive role. However, in the development of the real economy, due to the existence of various shocks, market failure occurs from time to time. Therefore, macro-control and government intervention come into being. With the realization of a well-off society in an all-round way by 2020, China has officially entered a new stage of economic development. In order to cope with the rapidly changing international situation and potential crises, the frequency and intensity of national macro-control are bound to increase, which may lead to the problem of economic policy uncertainty, that is, enterprises cannot fully expect the implementation, intensity and duration of the policies. It is found that the scale of corporate debt will be reduced due to frequent changes in economic policies (Jiang et al., 2018).

With the rapid development of text analysis technology, researches on unstructured information are increasing. Related analysis shows that various textual expression methods have a certain impact on the decision-making and behavior of different relevant groups (Zeng et al., 2018; Li & Jiang, 2020; Lin et al., 2016). The traditional view holds that hard information such as accounting information and financial data presented by enterprises is the key to obtaining loans (Stein, 2002). However, studies have found that the positive context contained in the relevant text information of enterprises helps to alleviate the information asymmetry gap between borrowers and lenders, and promotes enterprises to obtain sufficient financing at a lower cost to ease their own financing constraints (Zhao, 2020; Zhai & Yuan, 2020).

Whether the impact of economic policy uncertainty on corporate debt financing will change due to the positive context in the relevant text information of enterprises. Based on the data from 2011 to 2018, this paper finds that there is a weakening effect, that is, the optimistic text tone can weaken the negative impact of economic policy uncertainty on corporate debt financing. The possible marginal contribution of this paper is mainly to supplement the relevant research on text information analysis from the perspective of economic policy uncertainty.

2. Literature Review and Research Hypothesis

2.1. Literature Review

1) Analysis of text information—text tone and capital market

With the rapid development of natural language processing technology, the analysis of enterprise decision-making and capital market is no longer only focused on financial information, but also on text information. In related studies, Henry (2008) found that the tone in the earnings press release has a certain impact on the behavior and decision-making of external investors. Feldman (2010) pointed out that the change of tone in MD&A can cause a drift of stock returns.

Price et al. (2012) stated that, the language and the tone in conference calls are significant predictors of abnormal returns and trading volume. And in researches targeting the debt market, a study by Zhao Yuliang (2020) reported that the positive net tone in annual reports can promote the acquisition of debt financing. Wu Guotong and Li Yanxi (2019) pointed out that the scale of new debt and debt maturity structure will increase and become longer due to management's transitional optimism.

For a long time, the main means of debt financing has always been to borrow from banks. However, with the continuous improvement of the bond market, issuing bonds for financing has been increasing in corporate financing decisions. Yao Xiao et al. (2020) found that positive management tones lead to a reduction in credit spreads of bonds. Hu Jing (2020) based on the performance presentations showed that the net positive tone in the statement can relieve the financing constraint of the company.

2) Economic policy uncertainty, enterprise management and financing decision

Some studies have found that, as external risks rise with the increase of economic policy uncertainty, in order to hedge risks and prevent risks from causing huge losses, the financial and operational management strategies of enterprises will change. In terms of enterprise investment decision-making, Li Fengyu and Yang Mozhu (2015) found that frequently changing economic policies can lead to the reduction of enterprise investment scale. Rao Pingui et al. (2017) also certificated the existence of this inhibition effect, and for the mechanism analysis, Chen Guojin and Wang Shaoqian (2016) gave an explanation from the perspective of capital use cost and marginal income. The decrease in investment demand will in turn cause a corresponding decrease in corporate financing demand.

In terms of corporate financial strategies and financing decisions, Jiang Teng et al. (2018) pointed out that banks reduce their lending scale in the face of high economic policy uncertainty, and high expected inflation will exacerbate the credit crunch. Liu Lei et al. (2019) similarly found the reduction effect of high economic policy uncertainty on the scale of corporate debt, but there is a certain degree of increase in long-term borrowing in corporate debt. In addition, Wang Chaoyang et al. (2018) have stated that the dynamic adjustment speed of enterprise capital structure will slow down with the increase of economic policy uncertainty. Gong Rukai et al. (2019) verified that the enterprise leverage ratio has a negative response to the uncertainty of economic policy, and the degree of response is heterogeneous in different property rights and different enterprise sizes.

To sum up, existing studies mainly discuss the impact of economic policy uncertainty and text information analysis on corporate debt financing separately, while relatively few articles combine the two. On the basis of previous researches, this paper attempts to incorporate both text tone and economic policy uncertainty.

2.2. Research Hypothesis

1) Economic policy uncertainty, text tone and debt financing

With the continuous change of economic policies and the increase of uncertainty, financial risks in the capital market constantly accumulate. The uncertainty of corporate cash flow leads to higher default risk for lenders and a possible increase in non-performing loan ratios. Therefore, lending institutions will become more cautious during the audit and tighten credit (Baum et al., 2009; Francis et al., 2014; Gong et al., 2019). Meanwhile, higher policy uncertainty aggravates the asymmetry of internal and external information, which makes it more difficult for enterprises to obtain loans.

The hindrance for firms to obtain financing mainly stems from the information asymmetry between borrowers and lenders (Diamond & Verrecchia, 1991), so how to alleviate the information gap becomes the key for enterprises to obtain financing. Lending institutions have strict vetting procedures, among which accounting information and quantitative data of companies are the core indicators, which are regarded as the key to obtaining loans (Stein, 2002). Unlike quantitative information, textual information and non-financial information are expressed in rich ways, and scholars have found that incremental information exists in them, which can supplement financial information (Xie & Lin, 2015).

The positive signals conveyed by internal text information such as the positive tone in MD&A section, under the effect of signal transmission, state the views on the future prospects and risks faced by the enterprise from the perspective of the management (Qiu & Yang, 2021). In addition, the tone of risk warning in annual reports can help the capital market to identify risks in a timely manner. Consequently, the positive tone of the annual reports has a certain positive effect on corporate debt financing (Zhao, 2020); external text information which is based on the external investors, to some extent reflects the evaluation of the external capital market on the enterprise, and plays an important reference role for the decision-making of other participants (Luo & Song, 2021). Based on the above analysis, this paper puts forward the following hypothesis:

H1: High economic policy uncertainty has a negative inhibitory effect on corporate debt financing, while positive text information context can weaken this negative effect to some extent.

2) Economic policy uncertainty, text tone and debt financing under different ownership properties

State-owned banks are dominant in monetary funds. Relying on political association, the difficulty of state-owned enterprises in obtaining loans will be greatly reduced (Fang, 2007). The reason lies in the fact that state-owned enterprises take the national reputation as endorsement, and under the tilt of relevant policies, there is an implicit government guarantee behind them. Besides, the good bank-enterprise relationship so far has diluted the information asymmetry

between state-owned enterprises and banks. Due to the status advantages of state-owned enterprises, banks may conduct behaviors that go against the law of market operation when issuing relevant loans (Lai et al., 2016). Therefore, for SOEs, economic policy uncertainty and positive text tone may have little impact on their access to debt financing.

Unlike state-owned enterprises, however, non-state-owned enterprises are inherently exposed to greater risks (Sun et al., 2005). For the reason of reasonable risk aversion, banks and other lending institutions have a lower propensity to lend. For non-SOEs, relevant text information serves as an important reference for the credit evaluation of the enterprise by the lending institutions. A positive tone of text information can convey the current good business status of the enterprises and the enhanced control of risks, which is conducive to the recognition of creditors. Therefore, the role of textual information context will be more visible in non-state enterprises, which leads to the hypothesis:

H2: Compared with SOEs, non-SOEs will be more significantly affected by economic policy uncertainty, and the relevant positive text tone will significantly weaken this impact.

3) Economic policy uncertainty, text tone and debt financing under different enterprise sizes

Compared with large enterprises, the impact of liquidity restrictions on small enterprises is more profound and huge (Audretsch & Elston, 2002). In terms of information provision, the severity of information asymmetry is also greater for smaller firms (Berger & Udell, 1995).

Larger enterprises can provide more detailed and specific information, and external discussions and evaluations of larger firms are also more abundant. Consequently, the audit degree of lending institutions is relatively less strict, so larger enterprises are more likely to obtain credit support (Zhao, 2020). At the same time, the relevant text tone of larger enterprises can be a good aid to soft information, which gives them an advantage in obtaining credit. For smaller enterprises, however, under high information asymmetry, the authenticity of high text message tone needs to be examined, so the audit will be more stringent. In addition, in face of high external risks, smaller firms are more inclined to reduce their own risks by actively reducing financing. Based on the above analysis, this paper proposes the following assumption:

H3: The weakening effect of positive text information tone on the negative impact of economic policy uncertainty will be more significant in larger enterprises.

3. Research Design

3.1. Samples and Data

All listed companies in Shanghai and Shenzhen A-shares from 2011-2018 are selected as the initial sample, and the observations are treated as follows: 1) ex-

clude financial companies, such as banks and securities companies; 2) eliminate companies marked by ST and *ST; 3) exclude companies with major changes such as delisting and being acquired; 4) delete companies with serious missing data. Finally, 18,005 company-annual observations are obtained.

The text tone data comes from CNRDS database, the data measuring the level of economic policy uncertainty are from [policyuncertainty.com](#), and other company-level related data are obtained from Wind and CSMAR databases. In order to avoid the influence of extreme values, the continuous variables at the company level are treated with winsorize at the level of 1%.

3.2. Core Variable Definition

1) Corporate debt financing-DEBT

Measure the amount of new debt financing in a year. Referring to the research of [Covas and Haan \(2011\)](#), [Cai Guowei et al. \(2018\)](#) and [Zhao Yuliang \(2020\)](#), it is defined as the proportion of the increase of short-term borrowings, non-current liabilities maturing within one year, long-term borrowings, bonds payable and long-term payables in total assets. The increase in debt is obtained by making the difference between the end and the beginning of the year, and negative numbers are taken as zero.

2) Mixed text tone-MIXTONE

The text tone constructed in the past literature mainly comes from internal text information of enterprises. However, considering that the enterprise itself may have whitewashing behavior and create an overly optimistic context when transmitting relevant information to the outside, it is reasonable to include relevant information from external decision makers at the same time. Therefore, this paper defines a mixed tone (MIXTONE), which consists of 50% internal text tone and 50% external text tone, by combining internal text information and external text information.

The construction of internal text tone is based on the firms' annual reports. Considering the differences of diverse financial sentiment dictionaries, two types of dictionaries are used as the basis for the construction of the annual report tone in this paper. The first refers to [Xie Deren and Lin Le \(2015\)](#) and [Zeng Qingsheng et al. \(2018\)](#), and is based on [Loughran and Mcdonald's \(2011\)](#) financial sentiment dictionary. The second adopts the Chinese Sentiment Polarity Dictionary compiled by Taiwan University. Referring to [Li Shigang and Jiang Yaoming \(2020\)](#), [Zhang Cheng et al. \(2021\)](#) and [Li et al. \(2019\)](#), the annual report tone is defined as $(\text{Posnum}-\text{Negnum})/\text{VocabularyNum}$, where Posnum and Negnum respectively represent the number of positive and negative words in the annual report, and VocabularyNum represents the total number of words in the annual report. The annual report tone reflects the degree of positivity and optimism expressed in the text of annual reports. A higher value indicates that companies tend to create a more positive context when compiling annual reports, so as to convey to the outside world their optimistic attitude towards

their own prospects and future performance. The external text tone is constructed on the basis of stock bar comments, defined as the difference between the number of positive posts and negative posts divided by the total number of posts.

$$\text{MIXTONE} = 50\% \times \text{Annual Report TONE} + 50\% \times \text{GBTONE} \quad (1)$$

3) Economic policy uncertainty-EPU

This paper uses Economic Policy Uncertainty Index for China constructed by Scott Baker, Wang Xiaoxi and other scholars to measure the level of economic policy uncertainty for China. Since the initial data are monthly data, in order to obtain the annual economic policy uncertainty index, the monthly uncertainty index is weighted accordingly, giving a higher weight to the monthly uncertainty index closer to the end of the year, defined as $(\sum_{j=1}^{12} j * \text{PUI}_j) / 78$, where PUI_j is the uncertainty index of month j .

3.3. Model Building

To test whether the intensity of the effect of economic policy uncertainty on corporate debt financing is affected by the tone of corporate related text information, this paper constructs the cross-product term of economic policy uncertainty and text tone. Referring to the studies of Jiang Teng et al. (2018), Gong Rukai et al. (2019), and Wu Guotong and Li Yanxi (2019), the following model is established:

$$\begin{aligned} \text{DEBT}_{i,t} = & \alpha_0 + \alpha_1 \ln \text{EPU}_{i,t-1} + \alpha_2 \ln \text{EPU}_{i,t-1} \times \text{MIXTONE}_{i,t-1} + \alpha_3 \text{MIXTONE}_{i,t-1} \\ & + \alpha_4 \text{LEV}_{i,t-1} + \alpha_5 \text{SIZE}_{i,t-1} + \alpha_6 \text{AGE}_{i,t-1} + \alpha_7 \text{ROA}_{i,t-1} + \alpha_8 \text{GROWTH}_{i,t-1} \\ & + \alpha_9 \text{CR}_{i,t-1} + \alpha_{10} \text{FAR}_{i,t-1} + \alpha_{11} \text{DUAL}_{i,t-1} + \alpha_{12} \text{BOARDSIZE}_{i,t-1} \\ & + \alpha_{13} \text{INDEP}_{i,t-1} + \alpha_{14} \text{FIRSTHOLD}_{i,t-1} + \alpha_{15} \text{MSHARE}_{i,t-1} + \text{FIRM} \\ & + \text{YEAR} + \varepsilon \end{aligned} \quad (2)$$

where: the annual report of year $T - 1$ is disclosed in the following year T . The model controls firm-level (FIRM) and year-level (YEAR) fixed effects, and clustering and heteroskedasticity adjustment are carried out at the industry level (referring to the industry division standard of China Securities Regulatory Commission in 2012). Other control variables are shown in **Table 1**.

If the coefficient α_1 is negative and α_2 is positive, we argue that the positive tone of firm-related text information weakens the negative impact of economic policy uncertainty on corporate debt financing.

4. Empirical Results

4.1. Descriptive Statistics of Variables

Descriptive statistics of each variable are shown in **Table 2**. It can be seen that the median of debt financing (DEBT) is 0.033, and the mean is 0.066. The mean values of text tone MIXTONE1 and MIXTONE2 are 0.038 and 0.059, respectively, indicating that the overall tone of enterprise-related texts is positive, but the tone of some enterprises is pessimistic (negative value). The mean of uncertainty index

Table 1. Variable and interpretation.

Variable	Variable Interpretation
DEBT	Scale of new debt financing of enterprise
MIXTONE1	Mixed text tone 1 = 50% Annual report tone + 50% GBTONE, the number of positive words and negative words in the annual report tone based on the LM dictionary
MIXTONE2	Mixed text tone 2 = 50% Annual report tone + 50% GBTONE, the number of positive words and negative words in the annual report tone based on the Chinese Sentiment Polarity Dictionary compiled by Taiwan University
LnEPU	Ln(Annual economic policy uncertainty index)
LEV	Corporate leverage ratio, Total liabilities/Total assets
SIZE	Ln(Total assets at the end of year)
AGE	Duration of company listing
ROA	NI/Total assets
GROWTH	The growth rate of operating income
CR	Current assets/Current liabilities
FAR	Fixed assets/Total assets
DUAL	If the general manager and chairman are the same person, the value is 1, otherwise 0
BOARDSIZE	Ln(Number of board members)
INDEP	The proportion of independent directors on the board
Z-SCORE	Z value. Define the corporate financing constraint and measure the risk of bankruptcy
FIRSTHOLD	The shareholding ratio of the largest shareholder
MSHAR	Management shareholding ratio

Date source: CNRDS, CSMAR, policyuncertainty.com. Manual sorting.

Table 2. Results of descriptive statistics.

Variable	Obs	Mean	SD	Min	Med	Max
DEBT	18,005	0.066	0.089	0	0.033	0.470
MIXTOBE1	18,005	0.038	0.036	-0.048	0.036	0.130
MIXTONE2	18,005	0.059	0.036	-0.026	0.057	0.150
LnEPU	8	5.467	0.559	4.643	5.419	6.349
SIZE	18,005	22.131	1.257	19.830	21.964	26.038
LEV	18,005	0.425	0.209	0.050	0.416	0.892
ROA	18,005	0.042	0.056	-0.174	0.038	0.209
GROWTH	18,005	0.193	0.444	-0.522	0.116	2.918
CR	18,005	2.483	2.609	0.298	1.659	17.141
FAR	18,005	0.217	0.162	0.002	0.183	0.706

Continued

DUAL	18,005	0.267	0.442	0	0	1
BOARDSIZE	18,005	2.136	0.198	1.099	2.197	2.890
INDEP	18,005	0.374	0.055	0.182	0.333	0.800
Z-SCORE	18,005	5.020	6.015	0.176	3.102	39.332
FIRSTHOLD	18,005	0.349	0.147	0.093	0.330	0.748
MSHAR	18,005	0.132	0.198	0	0.003	0.679

Source: calculation results by stata 15.

is 5.467, and the maximum value is 6.349. The median and mean of Z-score are 3.102 and 5.020, respectively. It can be concluded that most enterprises are in good financial condition and have little chance of bankruptcy.

4.2. Multiple Regression Result and Analysis

The results of multiple regression are shown in **Table 3**. It can be seen that debt financing (DEBT) is significantly negatively correlated with economic policy uncertainty (LnEPU) at 1% level (-0.006772 , $t = -3.36$; -0.008733 , $t = -3.95$), indicating that the greater the uncertainty of economic policies, the less new debt financing enterprises can obtain. The reason may be that with the increase of the uncertainty of economic policies and the overall risk, lending institutions will increase the intensity of loan examination and tighten the intensity of credit supply. However, the interaction term between economic policy uncertainty and mixed text tone is significantly positive at 1% level (0.105381 , $t = 4.10$; 0.100847 , $t = 3.80$), that is, positive text tone weakens the negative impact of economic policy uncertainty on debt financing. Hypothesis 1 is verified accordingly. The cause might be that a positive text tone sends a signal to the capital market that the company is operating well, which helps alleviate the information asymmetry between lenders and borrowers.

An interesting point in the regression results is that the coefficient of mixed tone (MIXTONE) is significantly negative at the 1% level. Nevertheless, by observing the coefficients of interaction term and tone, it can be found that when economic policy uncertainty is low, too positive tone may have a negative impact on corporate debt financing, which may be explained by the fact that the examination of the authenticity of overly high text tone will be stricter under the condition of low risk. And when the uncertainty of economic policy is high, the positive text tone plays a better role in the weakening effect.

4.3. Heterogeneity Analysis

1) The property right nature of the enterprises

According to the nature of company equity, the enterprises are divided into non-state-owned and state-owned enterprises. The results of multiple regression under different property rights are shown in **Table 4**. From columns 2 and 3 of

Table 3. Result of multiple regression.

	DEBT	
LnEPU	-0.006772*** (-3.36)	-0.008733*** (-3.95)
MIXTONE*LnEPU	0.105381*** (4.10)	0.100847*** (3.80)
MIXTONE1	-0.467461*** (-3.30)	
MIXTONE2		-0.448583*** (-3.08)
Cons	0.637914*** (9.63)	0.648033*** (9.67)
Control Variable	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Ind Clustering	Yes	Yes
Obs	18,005	18,005
Adj-R ²	0.0407	0.0404

Note: *t* value in parentheses. *, **, *** respectively represent 10%, 5%, 1% significance level. Source: calculation results by stata 15. The following tables are the same.

Table 4. The influence of the nature of enterprise equity.

	Non-SOEs		SOEs	
	DEBT			
LnEPU	-0.010043*** (-3.34)	-0.012559*** (-3.59)	-0.001025 (-0.32)	-0.001383 (-0.33)
MIXTONE * LnEPU	0.142348*** (4.05)	0.135271*** (3.72)	0.016314 (0.28)	0.015568 (0.26)
MIXTONE1	-0.669845*** (-3.43)		-0.005216 (-0.02)	
MIXTONE2		-0.635019*** (-3.16)		-0.009967 (-0.03)
Cons	0.677785*** (10.11)	0.690852*** (10.21)	0.763577*** (7.52)	0.764533*** (7.33)
Control Variable	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Ind Clustering	Yes	Yes	Yes	Yes
Obs	11,390	11,390	6615	6615
Adj-R ²	0.0461	0.0458	0.0405	0.0403

Table 4, it can be found that for non-SOEs, economic policy uncertainty is significantly negatively related to debt financing at the 1% level (-0.010043 , $t = -3.34$; -0.012559 , $t = -3.59$), and the interaction term of text tone (MIXTONE) and LnEPU is significantly positively related to DEBT at the 1% level (0.142348 , $t = 4.05$; 0.135271 , $t = 3.72$). However, for SOEs, columns 4 and 5 of **Table 4** show a possible but insignificant negative correlation between LnEPU and DEBT, and a possible positive correlation between the interaction term and DEBT is also insignificant.

The comparison between columns 2 and 4 and between columns 3 and 5 of **Table 4** jointly shows that, compared with SOEs, the debt financing of non-SOEs is more significantly negatively affected by economic policy uncertainty. However, positive text tone can somewhat reduce the information asymmetry between lenders and borrowers and send a good signal to the capital market, which can weaken the negative effect of economic policy uncertainty on new debt financing of enterprises. Hypothesis 2 is verified by empirical evidence.

2) The size of enterprises

According to the total assets of listed companies at the end of the year, enterprises are divided into small enterprises and large enterprises. The results of multiple regression under different enterprise sizes are shown in **Table 5**. From row 3, it can be found that debt financing is significantly negatively correlated with economic policy uncertainty at a level of at least 5%. Column 4 and 5 show that for large enterprises, the interaction term between MIXTONE and LnEPU is significantly positively correlated with DEBT at the 1% level (0.178779 , $t = 3.45$;

Table 5. The impact of firm size.

	Small		Large	
	DEBT			
LnEPU	-0.006756^{**} (-2.08)	-0.007635^{**} (-2.00)	-0.008394^{***} (-2.64)	-0.011489^{***} (-3.06)
MIXTONE * LnEPU	0.022933 (0.55)	0.028719 (0.70)	0.178779^{***} (3.45)	0.166791^{***} (3.22)
MIXTONE1	-0.037166 (-0.15)		-0.835064^{***} (-2.86)	
MIXTONE2		-0.072017 (-0.30)		-0.777095^{***} (-2.66)
Cons	0.154503 (1.43)	0.159749 (1.45)	0.998556^{***} (6.88)	1.014921^{***} (6.90)
Control Variable	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Ind Clustering	Yes	Yes	Yes	Yes
Obs	9001	9001	9004	9004
Adj-R ²	0.0294	0.0294	0.0670	0.0663

0.166791, $t = 3.22$). And for small enterprises, there may be a positive correlation between the interaction term and DEBT, but it is not significant. Columns 2 to 5 of **Table 5** jointly suggest that positive text tone may alleviate information asymmetry more significantly in large firms than in smaller firms (Diamond & Verrecchia, 1991), which enhances lenders' confidence, and thus the negative effect of economic policy uncertainty on new debt financing of enterprises can be weakened to a certain extent. Hypothesis 3 is verified by empirical evidence.

4.4. Robustness Test

1) Endogeneity test

In order to deal with the possible endogeneity problem and ensure the reliability and robustness of the empirical results, 2SLS method based on instrumental variables is used for endogeneity test. Referring to the research of Zeng Qingsheng et al. (2018), the average text tone (AVRTONE) of the same industry in the same year except for the firm itself is selected as the instrumental variable. For companies in the same industry, the external financing environment is generally the same, so there is a certain correlation between the tone of the same industry. Meanwhile, the industry tone will not affect the debt financing of the company itself, and the exogeneity is satisfied, so this instrumental variable meets the standard of a good instrumental variable.

The regression results of the two stages are shown in **Table 6(a)** and **Table 6(b)**, from which it can be seen that LnEPU is significantly negatively correlated with DEBT at the 1% level (-0.025336 , $t = -5.59$; -0.034805 , $t = -5.52$), and the coefficient of the interaction term between MIXTONE and LnEPU was significantly positive at 1% level (0.531361 , $t = 5.56$; 0.505317 , $t = 5.40$). The results are consistent with the hypothesis, so the endogeneity problem is alleviated.

Table 6. (a) 2SLS first step regression result; (b) 2SLS second step regression result.

(a)				
	MIXTONE1 * LnEPU	MIXTONE1	MIXTONE2 * LnEPU	MIXTONE2
AVRTONE * LnEPU	1.018235*** (7.53)		0.965814*** (7.26)	
AVRTONE1		0.630410*** (4.56)		
AVRTONE2				0.688781*** (5.07)
Cons	0.053867 (0.61)	0.029657* (1.85)	-0.003326 (-0.03)	0.024408 (1.41)
Control Variable	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs	18,005	18,005	18,005	18,005

(b)		
	DEBT	
LnEPU	-0.025336*** (-5.59)	-0.034805*** (-5.52)
MIXTONE * LnEPU	0.531361*** (5.56)	0.505317*** (5.40)
MIXTONE1	-2.763432*** (-5.09)	
MIXTONE2		-2.616169*** (-4.93)
Cons	0.771511*** (14.08)	0.823568*** (13.34)
Control Variable	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Obs	18,005	18,005

Table 7. Explanatory variable substitution.

	DEBT	
LnEPU	-0.006887*** (-3.35)	-0.023710*** (-4.78)
NEWTONE * LnEPU	0.103145*** (5.20)	0.080588*** (3.94)
NEWTONE1	-0.446442*** (-4.02)	
NEWTONE2		-0.344231*** (-3.08)
Cons	0.641371*** (9.91)	0.732953*** (10.15)
Control Variable	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Ind Clustering	Yes	Yes
Obs	18,005	18,005
Adj-R ²	0.0424	0.0411

2) Internal tone—change of annual report tone

Reconstruct the internal text tone—annual report tone. According to the studies of Henry (2008) and Price et al. (2012), the new annual report tone is defined as the difference between the number of positive words and negative words divided by the sum of the two words, $(\text{Posnum} - \text{Negnum})/(\text{Posnum} + \text{Negnum})$. Bring the new tone (NEWTONE) into the model and the regression re-

sults are shown in **Table 7**. It can be found that the coefficient of economic policy uncertainty is significantly negative at 1% level (-0.006887 , $t = -3.35$; -0.023710 , $t = -4.78$), while the coefficient of the cross-product term is significantly positive at 1% level (0.103145 , $t = 5.20$; 0.080588 , $t = 3.94$). Consistent with previous results, the hypothesis is verified. The regression results of the heterogeneity part are not repeated for space reasons, which are basically consistent with the previous part and the hypotheses.

5. Conclusion and Suggestion

With the help of Economic Policy Uncertainty Index for China constructed by Scott Baker, Wang Xiaoxi and other scholars, this paper studies the debt financing of enterprises based on the relevant text information data and financial data of enterprises from 2011 to 2018. Due to the changing economic situation, national government needs to constantly change its economic policies in order to adapt to the international situation and cope with external shocks. The research results show that there is a significant negative relationship between economic policy uncertainty and the scale of new debt financing. The higher the uncertainty of economic policy, the lower the new debt financing available to enterprises. However, a positive context embedded in the relevant text information of the enterprise may, to some extent, convey the signal of the current good operation of the enterprise to the lender, so as to alleviate the pressure on financing, thereby weakening the negative impact of economic policy uncertainty on the debt financing of the enterprise.

It should be noted that, different from the intuitive quantitative information, disclosure rules and relevant standards have fewer restrictions and requirements on textual information (Li & Jiang, 2020). When arranging and disclosing text information, the management has a high degree of autonomy (Zhu & Xu, 2018), which will affect the tone environment of text information (Wang & Wang, 2018). Highly transparent and high-quality information disclosure can convey positive information of enterprises to the capital market. However, when information transparency is low, a large amount of negative news may be hoarded under positive internal text information, which will eventually cause stock price crash (Zhou et al., 2019). Therefore, in addition to fully considering whether the information disclosure of enterprises is appropriate, relevant regulatory agencies should not ignore the influence of the language atmosphere and emotional tendency created by the text information on the capital market. Besides, the weakening impact of economic policy uncertainty suggests that the government should strive to maintain policy continuous and gradual when making decisions, so that the trend of policies can be better understood by enterprises.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- Audretsch, D. B., & Elston, J. A. (2002). Does Firm Size Matter? Evidence on the Impact of Liquidity Constraints on Firm Investment Behavior in Germany. *International Journal of Industrial Organization*, 20, 1-17.
[https://doi.org/10.1016/S0167-7187\(00\)00072-2](https://doi.org/10.1016/S0167-7187(00)00072-2)
- Baum, C. F., Caglayan, M., & Ozkan, N. (2009). The Second Moments Matter: The Impact of Macroeconomic Uncertainty on the Allocation of Loanable Funds. *Economics Letters*, 102, 87-89. <https://doi.org/10.1016/j.econlet.2008.11.019>
- Berger, A. N., & Udell, G. F. (1995). Relationship Lending and Lines of Credit in Small firm Finance. *Journal of Business*, 68, 351-381. <https://doi.org/10.1086/296668>
- Cai, G. W., Li, Q., & Huang, Q. H. (2018). Corporate Social Responsibility, Media Promotion and Firms' External Financing. *Quarterly Journal of Finance*, 12, 1-26.
- Chen, G. J., & Wang, S. Q. (2016). How Does Economic Policy Uncertainty Influence Corporate Investment Behavior? *Finance & Trade Economics*, 5, 5-21.
- Covas, F., & Den Haan, W. J. (2011). The Cyclical Behavior of Debt and Equity Finance. *American Economic Review*, 101, 877-899. <https://doi.org/10.1257/aer.101.2.877>
- Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, Liquidity, and the Cost of Capital. *The journal of Finance*, 46, 1325-1359.
<https://doi.org/10.1111/j.1540-6261.1991.tb04620.x>
- Fang, J. X. (2007). Ownership, Institutional Environment and Capital Allocation. *Economic Research Journal*, 12, 82-92.
- Feldman, R., Govindaraj, S., Livnat, J., & Segal, B. (2010). Management's Tone Change, Post Earnings Announcement Drift and Accruals. *Review of Accounting Studies*, 15, 915-953. <https://doi.org/10.1007/s11142-009-9111-x>
- Francis, B. B., Hasan, I., & Zhu, Y. (2014). Political Uncertainty and Bank Loan Contracting. *Journal of Empirical Finance*, 29, 281-286.
<https://doi.org/10.1016/j.jempfin.2014.08.004>
- Gong, R. K., Xu, Y. X., & Wang, D. H. (2019). Economic Policy Uncertainty and Firm Leverage in China. *Journal of Financial Research*, 10, 59-78.
- Henry, E. (2008). Are Investors Influenced by How Earnings Press Releases Are Written? *The Journal of Business Communication*, 45, 363-407.
<https://doi.org/10.1177/0021943608319388>
- Hu, J. (2020). How Does Management Tone Affect Financing Constraints?—Textual Evidence Based on the Performance Presentations. *Journal of Wuhan University of Technology (Social Sciences Edition)*, 4, 103-114.
- Jiang, T., Zhang, Y. J., & Zhao, X. L. (2018). Economic Policy Uncertainty and Corporate Debt Financing. *Management Review*, 30, 29-39.
- Lai, L., Ma, Y. Q., & Xia, X. L. (2016). Media Coverage and Credit Access. *The Journal of World Economy*, 9, 124-148.
- Li, F. Y., & Yang, M. Z. (2015). Can Economic Policy Uncertainty Influence Corporate Investment? The Empirical Research by Using China Economic Policy Uncertainty Index. *Journal of Financial Research*, 4, 115-129.
- Li, M., Wu, H., Xiao, M., & You, J. (2019). Beyond Cheap Talk: Management's Informative Tone in Corporate Disclosures. *Accounting & Finance*, 59, 2905-2959.
<https://doi.org/10.1111/acfi.12554>
- Li, S. G., & Jiang, Y. M. (2020). Dose the Tone of Annual Reports Affect Audit Opinions? *Accounting Research*, 5, 178-192.

- Lin, H., Xu, Y. Y., & Liu, F. (2016). An Empirical Study on Framing Effects in China's Capital Market. *Economic Research Journal*, *51*, 161-175.
- Liu, L., Wang, Y. X., & Pan, J. (2019). Economic Policy Uncertainty, Management Governance and Corporate Debt Financing Decision. *Journal of Shanxi University of Finance and Economics*, *11*, 83-97.
- Loughran, T., & McDonald, B. (2011). When Is a Liability Not a Liability? Textual Analysis, Dictionaries, and 10-Ks. *The Journal of Finance*, *66*, 35-65.
<https://doi.org/10.1111/j.1540-6261.2010.01625.x>
- Luo, Q., & Song, M. W. (2021). Market Sentiment, Corporate Investment and Executive Compensation: Evidence Based on Stock Forum. *Business and Management Journal*, *43*, 120-136.
- Price, S. M., Doran, J. S., Peterson, D. R., & Bliss, B. A. (2012). Earnings Conference Calls and Stock Returns: The Incremental Informativeness of Textual Tone. *Journal of Banking & Finance*, *36*, 992-1011. <https://doi.org/10.1016/j.jbankfin.2011.10.013>
- Qiu, J., & Yang, N. (2021). Emotional Tone Signaling and Financing Constraints. *Journal of Zhongnan University of Economics and Law*, *5*, 75-88.
- Rao, P. G., Yue, H., & Jing G. H. (2017). Economic Policy Uncertainty and Firms' Investment. *The Journal of World Economy*, *2*, 27-51.
- Stein, J. C. (2002). Information Production and Capital Allocation: Decentralized versus Hierarchical Firms. *The Journal of Finance*, *57*, 1891-1921.
<https://doi.org/10.1111/0022-1082.00483>
- Sun, Z., Liu, F. W., & Li, Z. Q. (2005). Market Development, Government Influence and Corporate Debt Maturity Structure. *Economic Research Journal*, *5*, 52-63.
- Wang, C. Y., Zhang, X. L., & Bao, H. N. (2018). Economic Policy Uncertainty, the Dynamic Adjustment of Enterprises' Capital Structure and Stabilizing Leverage. *China Industrial Economics*, *12*, 134-151.
- Wang, H. J., & Wang, K. M. (2018). Accrual Management and Tone Management. *Accounting Research*, *4*, 45-51.
- Wu, G. T., & Li, Y. X. (2019). Over-Optimistic of Management and Corporate Debt Financing Decisions. *Journal of Industrial Technological Economics*, *38*, 130-144.
- Xie, D. R., & Lin, L. (2015). Do Management Tones Help to Forecast Firms' Future Performance: A Textual Analysis Based on Annual Report Earnings Communication Conferences of Listed Companies in China. *Accounting Research*, *2*, 20-27.
- Yao, X., Wu, D. X., & Pang, S. L. (2020). The Influence of Management Tone on Corporate Bond Credit Spread Based on Text Mining. *Economic Theory and Business Management*, *3*, 99-112.
- Zeng, Q. S., Zhou, B., Zhang, C., & Chen, X. Y. (2018). Annual Report's Tone and Insider Trading: Do Insiders Act as What They Said? *Journal of Management World*, *34*, 143-160.
- Zhai, S. P., & Yuan, K. L. (2020). Can Analysts' Site Visits Relieve Corporate Financing Constraints. *Journal of Shanxi University of Finance and Economics*, *42*, 113-126.
- Zhang, C., Zeng, Q. S., & Liang, S. Y. (2021). Can the Market Identify the Management's "Duplicitous"? Evidence from the Annual Report's Tone and Insider Trading. *Journal of Finance and Economics*, *4*, 154-168.
- Zhao, Y. P. (2020). Research on the Influence of Annual Report Net Tone on Enterprise Creditor Financing. *Business and Management Journal*, *42*, 176-191.
- Zhou, B., Zhang, C., & Zeng, Q. S. (2019). Annual Report's Tone and Stock Crash

Risk—Evidence from China A-share Companies. *Accounting Research*, 11, 41-48.

Zhu, Z. H., & Xu, W. H. (2018). Tone Management, Inefficient Investment and Earning Management. *Journal of Audit & Economics*, 3, 63-72.