

Perceived Uncertainty and Capital Structure: An Empirical Study Based on Chinese-Listed Companies

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Abstract. Against the backdrop of frequent uncertainty shocks, it is imperative to explore the impact of perceived uncertainty on the important corporate characteristic of capital structure. Therefore, this study conducts theoretical analysis and empirical tests on the relationship between perceived uncertainty and corporate capital structure using panel data of Chinese listed companies from 2008 to 2018. The estimation results of the relevant regression models indicate that perceived uncertainty significantly negatively affects corporate capital structure (leverage). Furthermore, this finding is more pronounced in non-state-owned enterprise samples. These findings have certain implications for enterprises in coping with uncertainty and promoting the optimization of corporate capital structure.

Keywords: perceived uncertainty; capital structure; overconfidence; market forces; corporate ownership.

1. Introduction

The global economy has seen a significant rise in uncertainty, with the GEPUI increasing by about 740% ^[1] from February 2007 to February 2025. This highlights the critical need for enterprises to effectively navigate through such volatility. Nie (2020) defines corporate perceived uncertainty as decision-makers' subjective evaluation of policy-related costs and benefits. As key units of the national economy, enterprises rely heavily on anticipating uncertainty to guide their decisions. Frequent policy changes can exacerbate operational risks, making this issue highly pertinent. Drawing from Weber and Hsee (1998), individual risk perception, particularly among professional managers and shareholders, is closely tied to the external environment. Popp and Zhang (2016) emphasize that enterprises' perception of uncertainty is a crucial determinant in their decision-making. Liu et al. (2022) further highlight that senior management's risk perception significantly influences corporate fixed asset investments. Against this backdrop, this study explores corporate perceived uncertainty to provide a more robust basis for corporate decision-making.

Capital structure, which involves the sources and proportion of enterprise financing, is vital for reducing financing costs and enhancing financial stability. Miller and Modigliani's MM theorem (1958) posits that in an idealized scenario without taxes and bankruptcy costs, capital structure does not affect firm value, laying the foundation for capital structure research. Research has identified numerous factors shaping corporate capital structure, such as tangible assets, non-debt tax shields, price-to-book ratio, firm growth, size, profitability, and earnings volatility (Hang et al., 2018). However, the perspective of Financial Economics of Uncertainty (FEPU) has received limited attention. As an emerging field, FEPU examines enterprises' financial behavior under uncertainty, offering insights into capital structure adjustments during uncertain times (Bloom et al., 2006). This study aims to explore corporate capital structure formation through the FEPU lens, providing new theoretical insights and empirical evidence for corporate financial decision-making.

The empirical research employs a sample of listed companies in China's A-share market, excluding financial firms and those with abnormal operations (ST), spanning from 2007 to 2018. Using the CSMAR and Wind Information databases, a panel dataset of 3,486 listed companies was constructed. Following Nie et al. (2020), the policy uncertainty perception index, extracted from corporate annual reports, serves as the key explanatory variable. The dependent variable is the asset-liability ratio (leverage ratio), with control variables including corporate operating conditions, scale, and years of

establishment. Regression models reveal a positive correlation between corporate asset-liability ratios and perceived uncertainty, significant at the 5% level. These results support hypothesis H1, indicating that enterprises exhibit varying perceptions of uncertainty under economic policy uncertainty shocks. Firms with heightened perceived uncertainty tend to accelerate deleveraging to mitigate negative impacts, while those with lower perceived uncertainty maintain a stable capital structure.

Further analysis distinguishes between state-owned and non-state-owned enterprises. The regression results of state-owned enterprises are insignificant, whereas those of non-state-owned enterprises are significant, suggesting heterogeneity in empirical data regarding corporate ownership, with non-state-owned enterprises exhibiting stronger uncertainty perception. Similarly, enterprises without overconfident managers show a stronger uncertainty perception than those with overconfident managers. Additionally, firms with large market power demonstrate a more pronounced perception of uncertainty than those with small market power.

The marginal contributions of this paper are threefold. First, it enriches the understanding of enterprise uncertainty perception from a micro perspective, contrasting with prior macro-focused studies on Economic Policy Uncertainty (EPU) (Bloom, 2014; Baker et al., 2016). Second, it broadens the exploration of the consequences of enterprise uncertainty perception, examining its impact on corporate capital structure. Third, it delves into the intrinsic relationship between enterprise uncertainty perception and capital structure, offering a more comprehensive understanding of corporate capital decisions and providing theoretical and empirical foundations for related fields. Amidst escalating global economic uncertainty, this paper offers vital references for exploring the relationship between uncertainty perception and capital structure, aiding in comprehending corporate decision-making strategies.

2. Literature Review and Theoretical Analysis

2.1 Literature Review

Existing studies measure uncertainty perception through three approaches: dependence on exogenous events (Julio & Yook, 2012), news-text-mined EPU indices (Baker et al., 2016), and stock-implied volatility (VIX) (Bloom, 2009). Among these, Bloom (2009) proposed an analytical framework using the VIX to analyze uncertainty shocks from major international events. This framework links stock market volatility to economic uncertainty, offering a lens to examine how uncertainty influences corporate decisions and macroeconomic outcomes.

Research on corporate capital structure has been a core issue in financial economics and corporate finance since the 20th century. Early literature primarily focused on the theoretical basis of capital structure under the conditions of no taxes and bankruptcy costs proposed by Miller and Modigliani (1958). As research progressed, scholars gradually realized that real-world enterprises face complex considerations when choosing a capital structure. A large body of literature, starting from information asymmetry (Byoun, 2008) and agency theory (Morellec et al., 2012), explored traditional influencing factors such as equity concentration (Li et al., 2021), ESG performance (Long and Ouyang, 2022), legal and policy factors (Wang et al., 2018). Jensen and Meckling (1976) proposed the agency cost theory, suggesting that the choice of capital structure is closely related to corporate governance structure and agency problems. Subsequent studies gradually expanded their focus to non-traditional factors such as the level of financial market development (Pan et al., 2021). In recent years, the continuous development of financial markets and the turmoil in the global economy have made the study of corporate capital structure more complex (Chen and Li, 2022). As one of the current hot research directions, the importance of digital transformation for optimizing corporate capital structure (Jin and Tian, 2023; Shen et al., 2022) has also received widespread attention from scholars. The impact of emerging concepts represented by uncertainty perception on corporate capital structure has become a research hotspot.

2.2 Theoretical Analysis

Prior studies have not only explored the formation of corporate capital structure and its influencing factors but also examined how enterprises can make more rational financing decisions in uncertain environments. Research on uncertainty perception covers the impact of economic policies, market uncertainty, and the global economic landscape. Su and Zeng (2009) found that capital structure decisions can be universally explained by the financing hierarchy theory, which emphasizes that enterprises may prefer conservative financing strategies to mitigate risks possibly brought by uncertainty. This preference reflects enterprises' pursuit of financial stability and risk aversion, especially in highly uncertain economic environments.

With the continuous evolution of the global economy, the impact of corporate uncertainty perception on capital structure has become more significant. Corporate decision-makers face greater challenges in highly uncertain economic environments, requiring them to make wise financing choices under changing conditions to ensure the financial health and sustainable development of enterprises.

In terms of empirical measurement, by examining changes in leverage ratios of enterprises, we can intuitively observe enterprises' perceptions of and responses to uncertainty. Based on the supply and demand effects summarized by Zhang et al. (2015), we can infer a negative correlation between economic policy uncertainty and corporate capital structure. The decline in leverage ratios often reflects enterprises' more passive adoption of debt financing, possibly to maintain financial stability, reduce financial risks, and ensure sufficient capital for business operations. This provides empirical evidence for the capital structure adjustment strategies adopted by enterprises in uncertain environments.

The connection between corporate capital structure and uncertainty perception is intricate and vital. When encountering economic policy uncertainty, firms' responses differ: those highly perceiving uncertainty see a larger risk impact, speeding up deleveraging to reduce capital structure and lessen shock effects; conversely, firms with lower uncertainty perception view the risk impact as smaller, leading to a slower deleveraging and capital structure adjustment. Based on this, the paper posits two hypotheses: H_0 : Enterprise perception of economic policy uncertainty does not decrease corporate leverage ratio; H_1 : Enterprise perception of economic policy uncertainty decreases corporate leverage ratio.

3. Research Design

3.1 Sample Scope and Data Source

This study examines Chinese A-share listed companies, excluding financial firms and those with abnormal operations (ST status). Data were sourced from the CSMAR database and Wind Information. The study period spans from 2007 to 2018, with meticulous data cleaning resulting in a panel dataset of 3,486 listed companies.

In the heterogeneity analysis, samples were categorized into three groups. First, companies were classified as state-owned listed firms (assigned a value of 1) if their actual controller was a state-owned enterprise or government department; otherwise, they were assigned 0. Among 25,154 observations, 4,577 were identified as state-owned enterprises. To enhance data robustness, winsorization at the 1% level was applied to all company-level variables. Second, using the median compensation ratio of the top three highest-paid executives as the threshold, samples were divided into enterprises with overconfident and non-overconfident managers. Among 24,807 observations, nearly equal numbers were classified into each category. Lastly, companies were split into those with significant and less market power. Among 24,807 observations, 12,403 were identified as having significant market power.

3.2 Variable Specification

The key explanatory variable selected in this study is the perception of economic policy uncertainty ($FEPU_{it}$), assured based on the index of policy uncertainty perception extracted from annual reports, referring to the operation in Nie et al. (2020).

The dependent variable selected in this study is the asset-liability ratio (leverage ratio), which refers to the proportion of total liabilities to total assets (Miguel and Pindado, 2001; Yu et al., 2012). Total liabilities include short-term and long-term liabilities, with short-term liabilities measured by the total amount of short-term liabilities and long-term liabilities measured by the total amount of long-term liabilities.

Control variables selected in this study are represented by $Controls_{it}$, following the practice of existing literature (Gulen and Ion, 2015; Wang, 2023), including (1) firm performance, measured by the total asset return rate; (2) firm size, measured by the natural logarithm of total assets; (3) firm age (age), measured by the natural logarithm of the firm's age plus 1.

3.3 Model Design

To examine the impact of corporate uncertainty perception on its capital structure, this study refers to existing literature (Nie et al., 2020) and establishes the following regression model:

$$Y_{it} = Constant + \beta \times X_{it} + Controls_{it} + \varepsilon_{it}$$

Where, i represents the company in the sample frame; t represents the number of years since the company's establishment. The dependent variable Y_{it} represents the leverage ratio. Constant represents the constant term. β represents the coefficient. The explanatory variable X_{it} represents the perception of economic policy uncertainty. $Controls_{it}$ represents the control variable group. ε_{it} represents the random disturbance term.

4. Empirical Analysis

4.1 Descriptive Statistics

Table 1 presents descriptive statistics of key variables. The leverage ratio (lev) averages 0.448, while the policy uncertainty perception index (fepu_2) has a mean of 0.079. Control variables, such as firm size (csc), show a mean of 22.135. Full statistics are detailed in Table 1.

Table 1 Descriptive Statistics of Variables

VarName	Obs	Mean	SD	Min	Median	Max
lev	24947	0.448	0.481	0.007	0.434	55.409
fepu_2	24947	0.079	0.094	0.000	0.048	1.323
ctrlp	24947	39.569	17.459	0.000	39.360	100.000
op	24947	34.767	18.260	0.000	33.860	114.435
csc	24947	22.135	1.427	15.418	21.923	30.952
ed	24947	1997.631	22.414	0.000	1958.000	2015.000
roa	24947	0.039	0.175	-20.548	0.039	7.445
cse	24947	4.755	8.016	-80.582	0.000	53.316
ctp	24947	37.330	16.099	0.000	36.170	139.960
cn	24947	0.182	0.386	0.000	0.000	1.000
inp	24947	47.759	24.919	0.000	50.660	104.628
mng	24947	12.357	20.209	0.000	0.070	100.000
bs	24947	8.831	1.880	0.000	9.000	19.000
idr	24947	37.203	5.606	0.000	33.330	100.000

4.2 Correlation Analysis

Table 2 reveals significant correlations ($p < 0.05$) between the leverage ratio (lev) and key variables. The asset-liability ratio is positively associated with perceived economic policy uncertainty

(fepu_2), firm size (csc), and institutional ownership (inp), but negatively correlated with controlling shareholders' rights (ctrlp, op), firm age (ed), profitability (roa), and managerial ownership (mng). Control variables exhibit pairwise correlations below 0.5, mitigating multicollinearity concerns.

Table 2 Correlation Coefficient Matrix

	lev	fepu_2	ctrlp	op	csc	ed	roa	cse	ctp	cn	inp	mng	bs	idr
lev	1	0.159*	0.060*	0.089*	0.531*	0.244*	0.452*	0.043*	0.034*	0.169*	0.225*	0.344*	0.179*	0.016*
fepu_2	0.063*	1	0.006	-0.007	0.210*	0.089*	0.073*	0.029*	-0.007	0.001	0.080*	0.117*	0.031*	-0.004
ctrlp	0.047*	-0.006	1	0.886*	0.055*	0.176*	0.171*	0.094*	0.824*	0.070*	0.358*	0.013*	0.063*	0.057*
op	0.057*	0.016*	0.897*	1	0.012	0.187*	0.157*	0.301*	0.725*	0.093*	0.205*	0.075*	0.081*	0.087*
csc	0.187*	0.216*	0.051*	0.034*	1	0.172*	0.161*	0.041*	0.057*	0.173*	0.397*	0.315*	0.250*	-0.001
ed	0.028*	0.015*	0.034*	0.033*	0.057*	1	0.120*	0.041*	0.146*	0.133*	0.114*	0.312*	0.098*	0.045*
roa	0.348*	0.013*	0.070*	0.066*	-0.005	0.004	1	0.004	0.166*	0.059*	0.077*	0.227*	0.028*	0.037*
cse	0.017*	0.024*	0.131*	0.312*	0.032*	-0.002	0.006	1	0.027*	0.117*	0.255*	0.165*	0.003	0.060*
ctp	0.033*	0.018*	0.803*	0.728*	0.069*	0.035*	0.069*	0.090*	1	0.104*	0.378*	0.080*	0.039*	0.037*
cn	0.067*	0.004	0.065*	0.093*	0.168*	0.024*	-0.004	0.077*	0.112*	1	0.292*	0.316*	0.204*	0.050*
inp	0.094*	0.085*	0.311*	0.178*	0.410*	0.048*	0.045*	0.265*	0.346*	0.295*	1	0.594*	0.223*	0.062*
mng	0.169*	0.124*	0.131*	0.231*	0.346*	0.080*	0.066*	0.237*	0.081*	0.273*	0.658*	1	0.193*	0.045*
bs	0.086*	0.051*	0.073*	0.081*	0.334*	0.022*	0.011	0.024*	0.045*	0.209*	0.238*	0.210*	1	0.490*
idr	-0.003	-0.010	0.071*	0.101*	0.021*	0.016*	-0.012	0.075*	0.057*	0.047*	0.065*	0.071*	0.402*	1

4.3 Baseline Regression Analysis

Table 3 presents the regression results for the hypotheses. The first column in Table 3 displays the estimation results controlling for firm and year-fixed effects, while the second column presents the estimation results controlling for firm, year-fixed effects, and control variables.

Looking at the estimation results in the first column of Table 3, it is observed that without controlling for the control variables, the coefficient estimate of fepu_2 is negative and significant at the 5% level. This indicates that the perception of economic policy uncertainty hurts the capital structure of the firm. The results in the second column indicate that after controlling for the control variables, the coefficient estimate of fepu_2 remains negative and significant at the 10% level. This suggests that even when controlling for other conditions, the perception of economic policy uncertainty still hurts the capital structure of the firm.

These results support hypothesis H_1 , indicating that under the uncertainty shock brought by economic policies, different firms perceive it differently. Firms that perceive high uncertainty believe that the impact of uncertain risks is stronger. Therefore, they accelerate the deleveraging process to optimize their capital structure and mitigate the negative impact of the shock. Conversely, firms with low uncertainty perception, believe that the impact of uncertain risks is relatively small. Hence, the deleveraging process will be relatively slow, and the adjustment pace of the firm's capital structure will be more stable.

Table 3 Benchmark Regression Results

Variables	(1) lev	(2) lev
fepu_2	-0.072** (0.037)	-0.063** (0.036)
ctrlp		0.015*** (0.002)
op		-0.015*** (0.002)

		-0.030***
csc		(0.006)
		-0.000
ed		(0.000)
		-0.449***
roa		(0.017)
		-0.017***
cse		(0.002)
		-0.001
ctp		(0.000)
		-0.013
cn		(0.010)
		-0.002***
inp		(0.000)
		-0.002***
mng		(0.000)
		0.004
bs		(0.003)
		-0.000
idr		(0.001)
Constant	0.455***	1.292***
	(0.004)	(0.284)
stkcd fix effect	Yes	Yes
year fix effect	Yes	Yes
N	24,947	24,947
R2	0.4534	0.4752

The numbers in parentheses represent the standard errors; ***, **, and * denote significance levels of $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively.

5. Further Analysis

5.1 Role of Ownership

Lin & Li (2004) found that state-owned enterprises (SOEs) face inefficiency due to policy burdens and soft budget constraints, while private firms under similar conditions require more government subsidies. Table 4 shows that non-SOEs exhibit a significant negative relationship between perceived uncertainty and leverage (coefficient: -0.099**), while SOEs show no significance, confirming ownership-based heterogeneity and aligning with Lin & Li (2004). SOEs benefit from policy protection, government support, and resource advantages, reducing their sensitivity to uncertainty. In contrast, non-SOEs, lacking policy buffers, rely on market competition and exhibit stronger uncertainty perception to mitigate risks. However, excessive soft constraints may harm SOEs' competitiveness and innovation, necessitating balanced reforms between policy support and market discipline.

Table 4 Regression Results of Ownership on Corporate Uncertainty Perception

Variables	(1) lev	(2) lev	(3) lev	(4) lev
fepu_2	0.030 (0.023)	0.009 (0.021)	-0.092* (0.047)	-0.099** (0.046)
Constant	0.514*** (0.002)	0.870*** (0.086)	0.441*** (0.005)	1.929*** (0.335)
Controls	No	Yes	No	Yes
stkcd fix effect	Yes	Yes	Yes	Yes

year fix effect	Yes	Yes	Yes	Yes
N	4480	4480	20330	20330
R ²	0.774	0.860	0.444	0.468

Numbers in parentheses represent standard errors; ***, **, * denote significance levels of $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. Columns (1) and (2) represent state-owned enterprises, while columns (3) and (4) represent non-state-owned enterprises.

5.2 Managerial Overconfidence

Wei (2018) observed that overconfident managers tend to adopt debt - financing strategies when making corporate capital structure decisions, which increases the company's leverage ratio. This reflects their optimistic expectations for the company's prospects and underestimation of risks. Against the backdrop of economic policy uncertainty, companies face various challenges. However, overconfident managers may hold an optimistic or negligent attitude towards economic policy uncertainty due to their overestimation of their abilities and the company's strength. This may lead them to underestimate potential risks and make more risky decisions.

To verify the hypothesis that managerial overconfidence significantly affects firms' perception of economic policy uncertainty and decision-making in an environment of economic policy uncertainty, we divided samples into companies with overconfident managers and non - non-overconfident managers based on the median ratio of compensation for the top three executives. The results in Table 5 show that the regression results of companies with managerial overconfidence are not significant, while those of companies without managerial overconfidence are significant. This indicates that there is heterogeneity in managerial overconfidence in the empirical data of this study.

Table 5 Regression Results of Managers' Overconfidence on Corporate Uncertainty Perception

Variables	(1) lev	(2) lev	(3) lev	(4) lev
fepu_2	-0.016 (0.038)	-0.011 (0.035)	-0.157** (0.070)	-0.157** (0.070)
Constant	0.436*** (0.004)	0.251* (0.130)	0.478*** (0.007)	3.703*** (0.438)
Controls	No	Yes	No	Yes
stkcd fix effect	Yes	Yes	Yes	Yes
year fix effect	Yes	Yes	Yes	Yes
N	11698	11698	12136	12136
R ²	0.669	0.728	0.407	0.419

Numbers in parentheses represent standard errors; ***, **, * denote significance levels of $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. Columns (1) and (2) correspond to overconfident managers, while columns (3) and (4) correspond to non-overconfident managers.

5.3 Corporate Market Power

Kong et al. (2013) highlighted market power's role in aiding companies in accessing government resources and support. In today's market economy, government subsidies are a key way for enterprises to obtain external resources. State-owned and loss-making enterprises often receive more subsidies, showing market power's importance in subsidy distribution. Also, Peress (2010) found that dominant firms often have higher stock trading volume, faster private information incorporation into price processes, and lower investor forecast dispersion, indicating market power's positive role in improving corporate information efficiency and financial market performance. Based on this, we propose that corporate market power significantly influences its perception of economic policy uncertainty. Companies with stronger market power can better handle economic policy uncertainty through their market position and information advantage.

To test this hypothesis, companies were categorized based on market power, with those above the median defined as having large market power and vice versa. The regression results in Table 6 show that companies with large market power have significant results, while those with small market power do not. This confirms the heterogeneity in corporate market power's impact on uncertainty perception in the empirical data.

Table 6 Regression Results of Corporate Market Power on Perceived Uncertainty

Variables	(1) lev	(2) lev	(3) lev	(4) lev
fepu_2	0.016 (0.014)	0.023* (0.013)	-0.018 (0.058)	-0.016 (0.057)
Constant	0.388*** (0.001)	-1.571*** (0.080)	0.512*** (0.006)	1.384*** (0.335)
Controls	No	Yes	No	Yes
stkcd fix effect	Yes	Yes	Yes	Yes
year fix effect	Yes	Yes	Yes	Yes
N	11857	11857	12070	12070
R ²	0.848	0.876	0.661	0.678

Numbers in parentheses represent standard errors; ***, **, * denote significance levels of $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. Columns (1) and (2) represent companies with market power greater than the median, while columns (3) and (4) represent companies with market power not greater than the median.

6. Conclusion and Recommendations

As global economic uncertainty grows, enterprises' perception of uncertainty becomes crucial in decision-making. This study explores how uncertainty perception influences corporate capital structure decisions amid economic policy uncertainty, market turbulence, and global economic shifts. Using a panel dataset of 3,486 Chinese A-share listed companies (2007–2018) and following Nie et al. (2020) to construct variables, the results show a significant positive link between corporate asset-liability ratios and uncertainty perception at the 5% level. Firms with higher uncertainty perception are more likely to deleverage to optimize capital structure and reduce shock impact, while those with lower perception adjust more cautiously.

Further analysis reveals that non-state-owned enterprises, which lack the policy privileges enjoyed by state-owned enterprises, exhibit stronger uncertainty perception. Enterprises with non-overconfident managers demonstrate stronger uncertainty perception than those with overconfident managers, likely due to the more prudent and rational decision-making style of non-overconfident managers. Additionally, companies with large market power have a stronger ability to perceive and cope with uncertainty than those with small market power, possibly due to their advantageous market position and stronger resource allocation ability.

Based on these findings, we propose the following strategies for governments, enterprises, and investors when dealing with economic policy uncertainty:

- (1) Governments should enhance policy communication and transparency to ensure the predictability of economic policies and provide a stable operating environment for enterprises. They should also establish risk warning mechanisms to monitor and evaluate potential risks in real-time and take timely measures to address them. Additionally, optimizing the business environment, reducing operating costs for enterprises, and stimulating market vitality are key steps to create favorable conditions for businesses.
- (2) Enterprises need to boost their risk perception capabilities, strengthen monitoring and analysis of the external environment, and respond promptly to potential risks. In terms of capital structure adjustment, they should flexibly adjust the proportion of debt and equity financing based on the

degree of uncertainty to optimize capital structure and reduce financial risks. Meanwhile, strengthening internal management, improving operational efficiency, and enhancing competitiveness are crucial for long-term success.

- (3) Investors should pay full attention to the risk status of enterprises when making investment decisions. They need to understand the risk management mechanisms and coping capabilities of enterprises and diversify their investment portfolios to reduce the risk of single assets, thereby achieving stable investment returns. When facing market fluctuations and economic uncertainty, investors should maintain a rational investment mentality, avoid blindly following trends or over-trading, and ensure the stability and sustainability of their investment behaviors.

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