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The impact of perceived economic policy uncertainty on firm value

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Abstract. In recent years, the Brexit, Sino US trade frictions and the emergence of the COVID-19 epidemic have had a serious impact on the world economy, and economic policies have been introduced frequently. In this context, as rational economic entities, will the perception of macroeconomic policy changes by enterprises have an impact on their value? This article explores the impact of economic policy uncertainty on corporate value from the perspective of economic policy uncertainty.This article selects non-financial companies listed on the A-share market from 2014 to 2023 as samples, uses text mining methods to extract information from corporate annual reports, constructs micro level economic policy uncertainty perception indicators, studies their impact on corporate value, and further explores their mechanisms of action. Research has shown that there is a negative relationship between perceived economic policy uncertainty and firm value. When perceived uncertainty increases, investment decisions and daily operations are also affected, which in turn affects firm value.

Keywords: economic policy uncertainty perception; text mining; enterprise value.

1. Introduce

In the past decade, events such as Brexit and Sino US trade frictions have kept the global economy depressed. In particular, the COVID-19, which broke out at the end of 2019, not only posed a huge threat to human health and life, but also had a serious impact on the global economy. Due to the outbreak of the epidemic and the implementation of prevention and control measures, trade and logistics transportation between countries have been severely disrupted. According to data from the United Nations Conference on Trade and Development, global trade volume decreased by over 3% in the first quarter of 2020, with trade volume in Asia dropping by over 25%. This has added insult to injury to the already sluggish global economy, posing great challenges and high levels of uncertainty to world trade and all businesses. In order to face this uncertainty, countries have also introduced corresponding economic policies, such as China lowering benchmark interest rates, strengthening infrastructure to stimulate domestic demand, and so on. However, frequent policy releases keep the economy in a constantly changing environment, and there is no accurate judgment of future policy expectations, leading to an increased sense of uncertainty.

As the largest economic entity in the market, macroeconomic policies not only affect the survival environment of enterprises, but also directly impact their development strategies and business layouts. Specifically, in terms of changes in the market environment, the government regulates indicators such as economic growth rate and inflation rate through monetary and fiscal policies. For example, whether the policy is loose or not determines the money supply and loan interest rates in the market, which directly affects the financing costs and willingness of enterprises to invest in production. In terms of resource allocation and industrial structure of enterprises, the government guides the investment direction of enterprises and optimizes resource allocation by adjusting tax policies, industrial policies, and regional policies. For example, for emerging industries and high-tech industries, the government often provides tax incentives and financial support to encourage enterprises to increase investment and promote industrial upgrading. This policy orientation helps enterprises seize market opportunities and achieve transformation and upgrading. In terms of the competitive landscape and market share of enterprises, policy changes often lead to adjustments in market structure and competitive landscape, and enterprises need to respond flexibly and seize opportunities. For example, the government may support enterprises in exploring the domestic market and reducing their dependence on foreign trade

by adjusting tariffs, export tax rebates, and other measures. This not only provides new development space for enterprises, but also requires them to strengthen independent innovation and enhance their core competitiveness. In short, when the intensity of economic policies is moderate, the direction is clear, and predictable, then for enterprises, they can make more accurate judgments about the future market, which will directly increase the value of the enterprise. On the contrary, when economic policies change frequently, it will increase the difficulty of enterprise judgment, affect their investment decisions, and thus bring adverse effects to enterprise value.

2. Research Design

2.1. Sample selection and source

This article selects Chinese listed companies as the research sample. Considering the availability of data and the frequent fluctuations in the global economy in recent years, the study period from 2014 to 2023 is chosen as the research interval. In order to reduce errors and improve accuracy, the following measures have been taken in this article:

Firstly, exclude sample data from financial and insurance companies.

Secondly, eliminate samples with severe data loss.

Thirdly, exclude the enterprise samples of ST and ST *.

Fourthly, the continuous variables involved in this article were subjected to bilateral truncation of 1% and 99%.

For data sources, this article refers to Nie Huihua's (2020) text analysis method, uses Python for data cleaning, and constructs economic policy uncertainty perception indicators. The company's financial data, as well as director data, research and development data, are all sourced from the CSMAR database and WIND database. Finally, 30633 observations were obtained from the research sample.

2.2. Explained variable (enterprise value)

There are roughly three mainstream methods in academia for measuring enterprise value: the first is based on the perspective of enterprise income, which believes that enterprise value is determined by the income that the enterprise can create, mainly considering the discount rate and cash flow factors, and evaluated through the free cash flow discount model or dividend discount model. However, the limitation of this method is that it has strong subjective factors. The second method is to use financial indicators for measurement, such as return on assets (ROA), return on equity (ROE), earnings per share (EPS), etc. However, this method can only be used to measure the short-term value of enterprises and is easily influenced by accounting standards and policies. The third method is the Tobin Q value method, which is an indicator for measuring the long-term market value of a company and is currently the most authoritative method in the academic community. It has the following advantages: (1) Tobin Q dynamically evaluates the enterprise value, not only measuring the company's past operating performance, but also measuring its future development prospects; (2) Taking into account the impact of inflation, it is not easily beautified by enterprises and can truly reflect the market's vision for the development of enterprises; (3) Linking market value with reset cost is more objective. The larger Tobin's Q, the greater the enterprise value. The calculation formula for Tobin Q is as follows:

Tobin Q=Enterprise Market Value/Enterprise Reset Cost

2.3. Explanatory variable (perception of economic policy uncertainty)

At present, the academic community's measurement of economic policy uncertainty is mostly based on the macro level, such as implied volatility in the stock market, EPU index, etc., while there is relatively little research on the perception of economic policy uncertainty at the enterprise level. This

article refers to the literature of Nie Huihua (2020) and constructs the explanatory variable (Uword) of this article by mining the Management Discussion and Analysis (MD&A) in the annual reports of listed companies.

The construction process of economic policy uncertainty perception is mainly divided into the following five steps:

Step 1: Obtain the text. This article uses web crawling technology to obtain the annual reports of non-financial listed companies in Shanghai and Shenzhen A-shares as source text data. The sample interval is from 2014 to 2023.

Step 2: Data preprocessing. Use Python to write a program to convert enterprise annual reports into TXT format that can be processed by text mining tools, and extract the "MD&A" section from it. Considering that when extracting indicators of economic policy uncertainty, the focus is mainly on the specific content that enterprises want to express, all numbers, English letters, special symbols, and punctuation marks other than periods in the text should be removed, and only the parts that are useful for the text content should be retained.

Step 3: Build a vocabulary list. According to the vocabulary method, specific text content can be extracted from "MD&A". This article refers to He Chao's (2021) classification of the vocabulary into three categories, namely the vocabulary representing "economic policies", the vocabulary representing "uncertainty", and others. The term 'economic policy' includes vocabulary related to government department names, economic policy names, and government measures; The "uncertainty" vocabulary includes words related to risk and uncertainty (see Table 1 for examples); Other word lists are established to reduce analysis errors, such as company names, owner's equity, etc., in order to avoid confusion between these fixed collocated words and ordinary words during later word segmentation.

Step 4: Text segmentation. Using periods as segmentation points, divide the text into several sentences, and use Python's self written program to call jieba segmentation to segment the sentences in the "MD&A" text into several words. In this process, on the one hand, it is necessary to eliminate words that have no practical meaning, such as "first", "therefore", "in summary", etc., that is, stop words. On the other hand, according to the "other word list", it is necessary to avoid the segmentation of proprietary terms that may cause bias in the analysis results, such as "changes in owner's equity", which is a fixed collocation accounting term and cannot be divided into "owner's equity" and "changes".

Step 5, construct indicators. Consider each sentence as a demonstrative function $I(s)$ and iterate through it. If a sentence contains words related to economic policies, it is defined as a sentence representing economic policies; If words related to economic policy and uncertainty appear simultaneously in a sentence, the sentence is defined as representing economic policy uncertainty. Then note that the total number of words representing "uncertainty" in this economic policy uncertainty sentence is n_s, and the total number of words in the text is N_{it}. Construct the perception of economic policy uncertainty ($Uword_{it}$) as follows:

$$Uword_{it} = \frac{\sum_{s=1}^{s_{it}} n_s * I(s)}{N_{it}} \quad (1)$$

Among them, when the sentence represents economic policy uncertainty, $I(s)$=1; otherwise, $I(s)$=0.

2.4. Control variables

In order to control for the impact of other factors on enterprise value, this article added the following control variables: enterprise size (Size), asset liability ratio (Lev), return on assets (ROA), cash flow ratio (Cashflow), growth, listing time (Age), and proportion of independent directors (Indep). The enterprise size is the natural logarithm of total assets, the asset liability ratio is the ratio of total liabilities to total assets, the return on assets is the ratio of net profit to total assets, the cash flow ratio

is the ratio of net cash flows generated from operating activities to total assets, the growth rate is the annual growth rate of operating income, the listing time is the logarithm of the number of years the enterprise has been listed, and the proportion of independent directors is the ratio of the number of independent directors to the total number of directors on the board of directors. In addition, time fixed effects and individual solid effects were added to the regression model.

Specific variables are shown in Table 1：

Table 1 Variable description

Variable type	Variable Name	Variable symbol	Variable definition
Dependent variable	enterprise value	TobinQ	Enterprise market value/enterprise reset cost
Explanatory variables	Perception of Economic Policy Uncertainty	Uword	formula 1.1×100
control variable	Enterprise scale	Size	Ln (total assets)
	Asset liability ratio	Lev	Total liabilities/total assets
	Asset return rate	ROA	Net profit/total assets
	Cash flow ratio	Cashflow	Net cash flows from operating activities/total assets
	Growth potential	Growth	Annual growth rate of operating revenue
	Listing time	Age	Ln (current year - listing year+1)
	Proportion of independent directors	Indep	Number of independent directors/total number of board members

3. Model construction

The relationship between perceived economic policy uncertainty and firm value is the focus of this study. In order to investigate the impact of perceived economic policy uncertainty on firm value, this paper constructs Model 1.2, as shown below:

$$TobinQ_{it} = \alpha_0 + \alpha_1 Uword_{it} + \sum_{k=1}^{7} \alpha_k Control_{kit} + Year_t + Firm_i + \varepsilon_{it} \quad (2)$$

Among them, $\mathrm{TobinQ_{it}}$ represents the enterprise value of enterprise i in year t,$\mathrm{Uword_{it}}$ represents the economic policy uncertainty perception of enterprise i in year t,$\mathrm{Control_{kit}}$ represents the NO.K control variable of enterprise i in year t,$\mathrm{Year_t}$ represents the fixed effect of year, used to control for changes in the macro environment, $\mathrm{Firm_i}$ represents the individual fixed effect, used to control for enterprise specific characteristics, and ε_{it} is the residual term. If the coefficient α_1 of the two is significantly positive, it indicates that the perception of economic policy uncertainty in enterprises promotes their value; If the coefficient α_1 of the two is significantly negative,it indicates that the perception of economic policy uncertainty in enterprises has a restraining effect on their value.

4. Empirical analysis

The benchmark regression results are shown in Table 2, with time fixed effects and individual fixed effects added. Among them, model (1) did not include control variables, and TobinQ and Uword were significantly negatively correlated at the 1% level, with a coefficient of -0.211. This indicates that the perception of economic policy uncertainty in enterprises does have a certain inhibitory effect on the growth of enterprise value. In addition, considering that financial and governance factors of a company may affect its value, control variables were added to model (2) for regression analysis. The Uword coefficient became -0.198 and was significantly negatively correlated with TobinQ at the 1% level. This result confirms hypothesis H1, which states that the greater the perception of economic policy uncertainty, the lower the value of the company. This may be because when economic policies frequently change, companies' sense of uncertainty increases, making market forecasting difficult.

Business decision-makers, driven by risk aversion, become cautious in both financing and investment activities, which inevitably affects the company's profitability and reduces its value.

In terms of controlling variables, there is a significant negative correlation between enterprise size and TobinQ, indicating that larger companies have lower growth potential and lower enterprise value. The cash flow ratio (Cashflow), asset liability ratio (Lev), return on total assets (ROA), growth, proportion of independent directors (Indep), and age of the company are all significantly positively correlated with TobinQ, indicating that the greater the company's liquidity, financial leverage, profitability, growth, regulatory oversight, and listing time, the better the company's performance and development, and thus the greater the company's value.

Table 2 Benchmark regression results

	(1)	(2)
	TobinQ	TobinQ
Uword	-0.211***	-0.198***
	(-3.542)	(-3.523)
Size		-0.566***
		(-38.275)
Lev		0.365***
		(6.353)
Cashflow		0.373***
		(4.237)
ROA		3.129***
		(27.358)
Growth		0.048***
		(3.278)
Indep		0.452***
		(3.217)
Age		0.722***
		(44.801)
_cons	2.167***	12.904***
	(116.225)	(40.746)
N	30633	30633
R^2	0.176	0.271
F	558.248	570.824

Note: * * *, * *, * respectively indicate significance at the 1%, 5%, and 10% levels, and the t-statistic is in parentheses.

5. Summary

This article selects non-financial A-share enterprises from 2014 to 2023 as samples and constructs a perception index of economic policy uncertainty for enterprises through text mining methods, exploring its relationship with enterprise value. The conclusion is as follows: the perception of

economic policy uncertainty has a suppressive effect on firm value. On the one hand, when economic policies fluctuate frequently and bring economic policy uncertainty to enterprises, as the main body of the economic market, enterprises do not have an accurate judgment of their future development expectations and market trends. In this situation, enterprises will feel confused, which makes management more inclined to wait and see, reduce high-risk investments, and become cautious in daily decision-making. If the enterprise cannot develop, its value will also be suppressed. On the other hand, when the perception of economic policy uncertainty increases, companies become less confident in their strategic decisions. At the same time, with the increase of friction in the financial market, the external environment also holds a negative attitude towards the development of enterprises. Investors will demand more returns in order to buffer the risks brought by their own investments, while financial institutions will increase their approval and supervision of enterprises in order to minimize risks. This invisibly increases the difficulty of financing for enterprises, thereby reducing their investment development. The liquidity or financial risks of enterprises will also increase, which is not conducive to the improvement of enterprise value.

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