

# Research on the Impact of Economic Policy Uncertainty on Corporate R&D Innovation: Evidence of China's Strategic Emerging Industries

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## Abstract

Based on the data of China's A-share listed strategic emerging industry companies from 2011 to 2019, this paper discusses the impact of economic policy uncertainty on R&D innovation. The research shows that the uncertainty of economic policy inhibits the R&D innovation of companies in strategic emerging industries; In the analysis of heterogeneity, it is found that under different property rights and asset scales, the uncertainty of economic policy can inhibit the R&D innovation of companies in strategic emerging industries, especially for non-state-owned or small-scale companies. Based on the research conclusion, this paper suggests that the government should continue to build a fully competitive, fair, transparent and open business system, and strategic emerging industry companies should take measures to improve corporate governance quality to alleviate the impact of economic policy uncertainty.

## Keywords

Economic Policy Uncertainty, Research and Development, Innovation, China's Strategic Emerging Industries

## 1. Introduction

China's strategic emerging industry refers to major technological breakthrough and development demand as the foundation, to the overall and long-term development of economy and the society important leading role, growth potential is huge industry, fusion is the emerging science and technology and the depth of

the emerging industries, both represents the direction of the scientific and technological innovation, also represents the direction of the industry development, It has the characteristics of high technology content, great market potential, strong driving ability and good comprehensive benefits. Energy conservation and environmental protection, information, biology, high-end equipment manufacturing, new energy, new materials, new energy vehicles and other strategic emerging industries are listed in China's official documents. Innovation is the first driving force to lead the economic development. How to remove obstacles and promote R&D innovation of strategic emerging industries with natural innovation needs will be crucial to the overall and long-term development of China's social economy. China's "14th Five-Year Plan" once again explicitly accelerates the development of strategic emerging industries, and gives full policy support to their R&D and innovation. However, related literature found that R&D innovation of companies in strategic emerging industries has special characteristics such as long cycle, large investment and high uncertainty. Under the distortion of information asymmetry and agency conflict, companies are generally inefficient in R&D innovation [1] [2]. Schumpeter, a famous economist, pointed out that any investment decision that does not consider government policies is unrealistic. Therefore, whether enterprises can adapt to the uncertain changes of economic policies and how the uncertain changes of policies will affect the technological innovation of enterprises have become an important theoretical issue in the design of economic policies. In practice, China is in the deep-water area of reform, and the macro-economy has entered a critical period of coordination and integration. All kinds of institutional, structural and cyclical problems in economic development need to be solved urgently, and economic policies are constantly adjusted and changed accordingly. Therefore, Chinese enterprises will continue to be in an uncertain policy environment. Under the current realistic background, quantitative analysis of the impact of economic policy uncertainty on Chinese enterprises' technological innovation and its mechanism based on micro-data is not only a realistic response to the government's concern about the impact of policy reform on the advantages and disadvantages of enterprise innovation, but also of great practical significance for enterprises to cope with policy uncertainty and improve innovation management level.

In addition, Marcus [3] thinks that it is difficult to evaluate the risks of innovation activities under the background of uncertain policies, and policy changes have different impacts on different industries. Therefore, based on the background of China's capital market, this paper chooses strategic emerging industry companies with distinctive R&D innovation as the object, and explores the influence of economic policy uncertainty on R&D innovation of companies from the micro-and macro-interactive perspectives, which should have positive significance.

The following structure of this paper is divided into five parts, including literature review and hypothesis, research design, empirical results and analysis, research conclusions and countermeasures, and further research directions.

## 2. Literature Review and Hypothesis

R&D is one of the most important investment activities of a company, especially for companies that are strategic emerging industries with innovation as their natural demand. According to the theories of Myers and Majluf [4], Jensen and Meckling [5], information asymmetry and agency conflict have great adverse effects on corporate investment decisions, for example, managers may have adverse selection and moral hazard. When the market doesn't know much about the company's operating conditions, the managers may have adverse selection, while the capital providers may take countermeasures by increasing the cost of capital use. The company may have financing constraints, and the company will give up relevant profitable investment projects due to lack of funds, resulting in insufficient investment of the company. When managers allocate enterprise resources with private interests, under incomplete contracts, managers will have moral hazard. By allocating projects that may not be suitable for shareholders to gain their own interests, such as blind expansion and building a "business empire", the result is over-investment. Different from conventional investment projects, R&D innovation projects have a series of outstanding characteristics, such as long-term, large investment, invisibility, high risk, strong confidentiality, opaque information disclosure, and difficult value evaluation. It can be seen that information asymmetry and agency problems are more prominent in R&D innovation decisions of companies. A large number of studies have found that the information asymmetry between the inside and outside of the company and the conflict between principal and agent are considered as the main distortion factors of the inefficiency of R&D innovation of the company [6].

It has an important influence on the R&D and innovation process of government companies, especially at present, China government clearly regards strategic emerging industries as the main thrust of high-quality economic development. According to the definition of Gulen and Ion [7], the uncertainty of economic policy means that the micro-unit of the market has no way to predict the scenario in which economic policy makers (governments) will be in our country and how to change existing economic policies (such as existing government subsidies, tax incentives, etc.). It can be seen that the uncertainty of economic policy is an unavoidable systemic risk of the company. Pastor and Veronesi [8] thinks that the uncertainty of the environment will make the company's investment behavior cautious, especially for high-risk innovative projects, and the company even deals with this uncertainty by reducing its investment. Based on the view of investment information, uncertainty increases the value of waiting for new information. If the uncertainty always exists, the company will take short-term and steady investment projects as the second-best choice. Because of the long cycle and high probability of failure of innovative projects, companies become more sensitive to innovative investment. At the same time, under the uncertainty of economic policy, it is more difficult to obtain information, so that managers can't effectively evaluate the value of R&D innovation, which eventually leads

companies to be more cautious about R&D investment. Based on the theoretical framework of information asymmetry and agency problem, information asymmetry and agency conflict are the main distortion factors that cause the inefficiency of R&D innovation. Venky *et al.* [9] found that the uncertainty of macroeconomic policies reduces the quality of the company's information environment and aggravates the information asymmetry inside and outside the company. Moreover, the higher the external uncertainty is, the more beneficial it is for managers to cover up their self-interest behaviors, and it is easier for managers to cover up "bad news", and it is easier for them to blame their own lack of efforts in R&D and innovation on the uncertainty of economic policies. Wang and Liu [10] found that when the external macro uncertainty is large, the company insiders are more likely to have earnings management, which in turn makes the agency conflict of the company more serious and ultimately damages the company's R&D and innovation. From the perspective of financing constraints, strategic emerging industry companies are in the growth stage of their life cycle, and need a lot of funds to support their R&D and innovation. However, the company's business activities will be affected by the uncertainty of economic policies, which will lead to the rise of the company's risk of debt and the risk of project default. At the same time, the uncertainty of economic policies will affect investors' judgment of the future situation, reduce their willingness to invest abroad and increase the capital cost, which will lead to the lack of financial support for R&D and innovation projects with high risks. However, high-risk innovation projects often have a long-term development for the company. To sum up, this paper puts forward the research hypothesis:

Under the background of strategic emerging industries, the uncertainty of economic policy inhibits the company's R&D innovation.

### 3. Research Design

#### 3.1. Samples and Data Sources

In view of the fact that China's economic policy accelerated the cultivation and development of strategic emerging industries in 2010, and the COVID-19 outbreak in 2020 made the economic policy change unusual and uncomparable, and considering the availability of the required data, this paper finally selected the 2011-2019 data of strategic emerging industries listed on A shares as evidence. At present, China Securities Regulatory Commission has not classified listed companies in strategic emerging industries in a unified way. Based on the practices of Wang and Zhang [2] and the Classification of Strategic Emerging Industries (2018) of China National Bureau of Statistics, this paper further selects samples according to the following conditions. First, only companies whose main business income accounts for more than half of the standard of strategic emerging industries are retained; Second, the company can't have ST-related marks during 2010-2019; Third, choose only listed companies in A share; Fourthly, eliminate the samples with missing or abnormal data. Fifthly, because

the data of the last three years are needed for the variables of corporate social responsibility, the company's listing time should be greater than or equal to three years. In addition, because extreme values and abnormal values are inevitable in continuous variables, Winsorize tail-shrinking is adopted in the first and last 1% quantiles of continuous variables in this paper. In this paper, the uncertain data of China's economic policy are obtained from Policy Uncertainty website (<http://www.policyuncertainty.com>), the website, set up by Professors Baker, Bloom and Davis, provides free data on economic policy uncertainty in countries and is widely used by academics. The financial data of sample companies are obtained from CSMAR (<http://www.csmar.com/>) and related annual reports. CSMAR is one of the largest accounting and economy-related databases in China. CSMAR provides reliable data for scholars to study Chinese listed companies. In the end, 521 companies were selected as samples in this paper, which is close to 543 by Wang and Zhang [2]. The final sample number of this paper is 4172. The statistical analysis software used in this paper is Stata 17 version.

## 3.2. Selection of Variables

### 3.2.1. R&D Innovation of the Company

Input and output are two levels of R&D innovation. R&D investment is generally measured by the ratio of R&D investment to operating income or the ratio of R&D investment to total assets, and R&D innovation output is generally reflected by the number of patent applications and other related indicators. Because the country generally adopts the reward policy of giving high subsidies to patent applications of strategic emerging industries, there is a "Great Leap Forward" phenomenon in which companies apply for patents for subsidies, but ignore the utility or quality of patents. Moreover, because strategic emerging industries are technological innovation-oriented companies, compared with the total assets, the market-oriented operating income can better reflect the future value of the company. Based on this, this paper measures the company's R&D innovation by dividing the company's R&D expenditure by its operating income (expressed as RD). As the explained variable of this paper's modeling, the larger RD is, the better R&D innovation of the company is.

### 3.2.2. Economic Policy Uncertainty

The measurement of economic policy uncertainty is not easy. Because economic policies are promulgated and implemented by the government, many literatures use the stability of government officials as a substitute variable for economic policy uncertainty, and because economic policies are often transmitted through financial instruments, some literatures also use the stability of local fiscal revenue and expenditure as a substitute variable for economic policy uncertainty. Since Baker *et al.* [11] used the method of text retrieval, filtering and analysis of South China Morning Post to construct a statistical index reflecting the uncertainty of China's economic policy, it has been widely used by domestic scholars. Yang *et al.* [12] think that compared with the perspective of government offi-

cials' stability or financial revenue and expenditure volatility, index is based on a wider range of texts, is more comparable, and more comprehensively reflects the fluctuation of economic policies. Based on this, using the practice of Yang *et al.* [12] for reference, the uncertainty of economic policy is measured by Baker index. Because the Baker index provides monthly data on the website of Policy Uncertainty, and in order to eliminate seasonal fluctuation, and other variables in this paper are annual data, this paper uses the geometric average method to convert monthly data into annual data, and makes natural logarithm processing, so as to maximize the coordination of data time period and data magnitude, as shown in the following model (1).

$$EPU = \ln \sqrt[12]{EPU_1^{\text{month}} \times EPU_2^{\text{month}} \times \dots \times EPU_{12}^{\text{month}}} \quad (1)$$

The monthly data of economic Policy Uncertainty provided on the website of Policy Uncertainty is represented by. Economic policy uncertainty is expressed by EPU. The larger EPU is, the more unstable economic policy is  $EPU^{\text{month}}$ .

### 3.2.3. Control Variables

In order to improve the explanatory power of the research model and learn from the practices of Yang *et al.* [12] and Gu *et al.* [13], this paper uses company size, investment opportunity, leverage level, operating cash flow ratio, asset structure, property right nature and ownership structure as control variables. The variables used in this paper are described in **Table 1**.

**Table 1.** Variable description.

| Variable type            | Variable name                                     | variable symbol | variable declaration  |
|--------------------------|---|-----------------|---|
| Explained variable       | R&D innovation                                    | RD              | Annual R&D expenses/operating income  |
| Explanatory variable     | Economic policy uncertainty                       | EPU             | As shown in model (2)   |
|                          | Company size                                      | SIZE            | Find the natural logarithm of total assets at the end of the year.            |
| Control variable<br>(CV) | investment opportunity                            | GR              | Annual growth rate of operating income  |
|                          | Operating cash flow ratio                         | CFO             | Net cash flow from operating activities/total assets at the end of the year   |
|                          | Asset-liability ratio                             | LEV             | Total liabilities/assets at the end of the year                               |
|                          | Debt term   | STD             | Current liabilities/total liabilities at the end of the year                  |
|                          | The shareholding ratio of the largest shareholder | FH              | Number of shares held by the largest shareholder/total number of shares       |
|                          | asset structure                                   | FS              | Amount of non-current assets/total assets at the end of the year              |
|                          | Property right nature                             | STA             | The actual controller is state-owned, and the value is 1; otherwise, it is 0. |
|                          | Year  | Year            | dummy variable  |
| industry                 | Indus   | dummy variable  |   |

### 3.3. Model Design

In order to avoid possible problems of reverse causality and endogeneity, this paper draws on the practice of Gu *et al.* [13]. In this paper, explanatory variables and control variables are delayed by one period, and the test models are controlled by year and industry, as shown in Model (3). If economic policy uncertainty inhibits firm R&D innovation, EPU coefficient is significantly negative.

$$RD_{i,t} = \beta_1 + \beta_2 EPU_{i,t-1} + \gamma CV_{i,t-1} + \sum Year + \sum Indus + \varepsilon \quad (2)$$

In the above test model (2),  $i$  is the company of different samples,  $t$  is the current period, and CV is the general name of all control variables.

## 4. Empirical Results and Analysis

### 4.1. Descriptive Statistics and Correlation Analysis

**Table 2** describes the quantitative characteristics of key variables in this paper. The average value (median value) of R&D innovation (RD) of strategic emerging industries in China is 0.0559 (0.0372), the maximum value (minimum value) is 0.4425 (0.0012), and the standard deviation is 6.28%. The data show that R&D innovation of companies in strategic emerging industries is quite different. The average (median) of economic policy uncertainty (EPU) is 5.6431 (5.9412), the maximum (minimum) is 6.0000 (4.7938), and the standard deviation is 37.21%. **Table 2** data also shows that among China's strategic emerging industries, state-owned property accounts for 46.45%.

In order to preliminarily judge the correlation degree between variables, this paper makes Pearson correlation analysis. As shown in **Table 3**, the correlation coefficient between R&D innovation (RD) and economic policy uncertainty (EPU) is significantly negative at the confidence level of 1%. The correlation conclusion supports the research hypothesis, which preliminarily shows that economic policy uncertainty inhibits R&D innovation of strategic emerging industry companies. **Table 3** shows that the correlation coefficient between two variables is not large (both less than 0.5), which indicates that the problem of multicollinearity is in the test model of this paper.

### 4.2. Mean Value Test

Because the R&D innovation variables of strategic emerging industry companies belong to continuous data, obey or approach normal distribution, and meet the conditions of double independent sample T test, this paper takes the median of economic policy uncertainty (EPU) as the cut point, divides all samples into two groups, and takes the R&D innovation (RD) of the company as the test variable for double independent sample mean T test. As shown in **Table 4**, the confidence level of R&D innovation of companies with high and low economic policy uncertainty is significantly different by 1%, which shows that when the economic policy is highly uncertain, the R&D innovation of companies is lower, which supports the research hypothesis.

**Table 2.** Descriptive statistics of key variables.

| variable name | Number of observations | average/mean value | mid-value | standard deviation | minimum value | maximum |
|---------------|------------------------|--------------------|-----------|--------------------|---------------|---------|
| RD            | 4127                   | 0.0559             | 0.0372    | 0.0628             | 0.0012        | 0.4425  |
| LCSR          | 4127                   | 0.3784             | 0.2102    | 0.1877             | 0.0044        | 0.6866  |
| EPU           | 4127                   | 5.6431             | 5.9412    | 0.3721             | 4.7938        | 6.0000  |
| SIZE          | 4127                   | 21.2654            | 21.5621   | 1.1232             | 18.7253       | 24.1393 |
| STA           | 4127                   | 0.4645             | 0.0000    | 0.4987             | 0.0000        | 1.0000  |

**Table 3.** Pearson correlation analysis results.

| variable | RD       | EPU      | LEV      | SIZE    | GR      | STA     | OC      | ROA     | CFO |
|----------|----------|----------|----------|---------|---------|---------|---------|---------|-----|
| RD       | 1        |          |          |         |         |         |         |         |     |
| EPU      | -0.112** | 1        |          |         |         |         |         |         |     |
| LEV      | -0.075** | 0.082    | 1        |         |         |         |         |         |     |
| SIZE     | -0.265** | 0.115**  | 0.342**  | 1       |         |         |         |         |     |
| GR       | 0.052**  | 0.001    | 0.042*   | 0.067** | 1       |         |         |         |     |
| STA      | -0.126** | -0.049** | 0.187**  | 0.376** | -0.019  | 1       |         |         |     |
| OC       | 0.081**  | 0.011    | 0.042**  | 0.332** | 0.053** | 0.076** | 1       |         |     |
| ROA      | 0.013    | 0.060    | -0.421** | 0.089** | 0.006   | -0.001  | 0.146** | 1       |     |
| CFO      | 0.021    | -0.091** | -0.142** | 0.065** | -0.018  | 0.031   | 0.153** | 0.344** | 1   |

Note: The upper right marks \*\* and \* indicate that the confidence level is 1% and 5% respectively.

**Table 4.** Test variables are T test results of R&D innovation.

| Grouping variables   | Test variable: R&D innovation (RD) |          |
|--|------------------------------------|----------|
|  | average/mean value                 | T value  |
| Economic policy uncertainty (EPU) $\geq$ median (high uncertainty group) | 0.029                              | -2.821** |
| Economic policy uncertainty (EPU) $<$ median (low uncertainty group)     | 0.064                              |          |

Note: The upper right mark \*\* indicates that the confidence level is 1%.

### 4.3. Benchmark Regression

The data in this paper belong to panel data. After Hausman test, the model (2) adopts the fixed effect regression analysis of control year and industry. In view of the fact that the sample data has the unbalanced mixed characteristics of cross-section and time series, in order to avoid the heteroscedasticity and correlation of time series and cross-section data in unbalanced mixed data, this paper uses Petersen's method to process the annual and company two-dimensional

group data. Firstly, the multicollinearity test is carried out on the test model, and the results show that the variance expansion factor (VIF) is not high, all of which are less than 3, and the correlation coefficient between two variables is small, which shows that the multicollinearity problem has little influence on the test model.

Column (1) of **Table 5** is the result of benchmark regression. The data show that EPU coefficient is significantly negative at the level of 1%, which indicates that in strategic emerging industries, economic policy uncertainty inhibits the company's R&D innovation, and empirical support for the research hypothesis. Economic policy uncertainty makes managers of strategic emerging industry companies more cautious about R&D innovation. Uncertainty worsens the quality of information transmission inside and outside the company, and investors become cautious about R&D innovation projects.

#### 4.4. Heterogeneity Analysis

Based on the research of Yang *et al.* [12], companies with government background have more "relationship" resources to alleviate the impact of economic policy uncertainty on R&D innovation. This paper divides the data into non-state-owned and state-owned groups according to the nature of property rights for regression analysis. Based on the research of Li and Tang [14], the R&D innovation of companies with different asset SIZES is different. This paper takes the median of company size (the natural logarithm of total assets at the end of the period) as the cut point, and divides the data into two groups: large asset size and small asset size, and makes regression analysis.

**Table 5.** Regression analysis results.

| variable               | (1)                   | (2)                  | (3)                   | (4)                     | (5)                    |
|------------------------|-----------------------|----------------------|-----------------------|-------------------------|------------------------|
|                        | Full sample           | State group          | Non-state group       | Large asset scale group | Small asset size group |
| Intercept term         | 0.087***<br>(3.345)   | 0.075***<br>(3.214)  | 0.094***<br>(3.875)   | 0.085***<br>(3.575)     | 0.093***<br>(3.864)    |
| EPU                    | -0.058***<br>(-3.274) | -0.020**<br>(-2.132) | -0.035***<br>(-3.987) | -0.021***<br>(-2.213)   | -0.039***<br>(-4.012)  |
| CV                     | control               | control              | control               | control                 | control                |
| Year and Indus         | control               | control              | control               | control                 | control                |
| variance ratio         | 65.452***             | 72.673***            | 71.537***             | 73.678***               | 89.853***              |
| ADJ.R <sup>2</sup>     | 0.063                 | 0.076                | 0.073                 | 0.081                   | 0.098                  |
| Number of observations | 4127                  | 1917                 | 2210                  | 2064                    | 2063                   |

Note: \*\*\*, \*\* in the upper right corner of the numerical values indicate that they are significant at the confidence level of 1% and 5% respectively, and the numerical values in brackets are T values.

Columns (2) and (3) of **Table 5** are heterogeneity analysis of different property rights, and columns (4) and (5) are heterogeneity analysis of different asset sizes. The EPU coefficient of data is significantly negative at 5% confidence level in state-owned property rights and large asset scale groups, and significantly negative at 1% level in non-state-owned property rights and small asset scale groups, which indicates that economic policy uncertainty inhibits R&D innovation of companies in different property rights and asset scales, and economic policy uncertainty inhibits R&D innovation of non-state-owned companies and companies with smaller assets more obviously. The reason may be that state-owned companies and companies with large assets are relatively more politically connected, have more “relationship” resources, and have more rent-seeking advantages for government policy information. Therefore, these companies are more resistant to economic policy uncertainty.

## 5. Robustness Test

### 5.1. The Method of Replacing Variables

In order to verify the reliability of the above empirical conclusions, this paper uses the robustness test method of substitution variables to make regression analysis on the test model again. The regression results of robustness test are shown in **Table 6**. Compared with the above regression results, there is no qualitative change in the regression results of robustness test, which indicates that the above research conclusions in this paper have good reliability. The specific inspection is as follows.

**Table 6.** Regression analysis results of robustness test.

| variable name          | (1)                   | (2)                   | (3)                   |
|------------------------|-----------------------|-----------------------|-----------------------|
|                        | APP                   | GRA                   | RD                    |
| Intercept term         | 0.445***<br>(8.135)   | 0.356***<br>(6.875)   | 0.098***<br>(5.895)   |
| EPU                    | -0.112***<br>(-2.782) | -0.103***<br>(-2.621) | -                     |
| EPU2                   | -                     | -                     | -0.030***<br>(-3.135) |
| CV                     | control               | control               | control               |
| Year and Indus         | control               | control               | control               |
| variance ratio         | 69.797***             | 68.435***             | 71.932***             |
| ADJ.R <sup>2</sup>     | 0.062                 | 0.060                 | 0.071                 |
| Number of observations | 4127                  | 4127                  | 4127                  |

Note: \*\*\* in the upper right corner of the numerical values indicate that they are significant at the confidence level of 1% and the numerical values in brackets are T values.

First, because the R&D innovation of companies in strategic emerging industries will be mostly manifested in the number of patent applications and the number of authorizations, Yang *et al.* [12] used the logarithm of the total number of patent applications plus 1 (expressed by APP) and the total number of authorizations plus 1 (expressed by GRA) as the explained variables. The results are shown in (1) and (2) of **Table 6**.

Secondly, Baker index measures the uncertainty of economic policy by mining newspaper text information, and different text ranges may lead to measurement errors of this algorithm. Besides taking the South China Morning Post as the text, based on the research of Davis *et al.* [15], the website of Policy Uncertainty provides another text range for measuring the uncertainty of China's economic policy, that is, using the algorithm of Baker index to mine the text information of authoritative newspapers People's Daily and Guangming Daily in Chinese mainland and measure the uncertainty of economic policy. Therefore, this paper uses the uncertainty index of China's economic policy developed by Davis *et al.* [15] as a replacement variable (EPU2). The results are shown in (3) of **Table 6**.

## 5.2. Instrumental Variable Method

Considering that the model may have endogenous problems and reverse causality problems, this paper uses the method of instrumental variables to test it. Referring to the method of Gu *et al.* [13], we use the economic policy uncertainty indicators of the United States as instrumental variables respectively, and make two-stage regression. In the first stage of regression, the uncertain indicators of American economic policy are significantly positively correlated with those of China's economic policy. **Table 7** shows the results of the second stage regression, and it can be found that EPU estimation coefficients are significantly negative, indicating that the regression results show that the benchmark regression is robust.

In addition, because the company's R&D innovation may be influenced by the early performance of the company's R&D investment in the later period, in order to avoid this influence, this paper refers to the practice of Fang *et al.* [16],

**Table 7.** Inspection of instrumental variable.

| variable name          | RD                    | APP                   | GRA                   |
|------------------------|-----------------------|-----------------------|-----------------------|
| EPU                    | -0.085***<br>(-4.234) | -0.076***<br>(-4.102) | -0.071***<br>(-4.015) |
| CV                     | control               | control               | control               |
| Year and Indus         | control               | control               | control               |
| ADJ.R <sup>2</sup>     | 0.065                 | 0.064                 | 0.061                 |
| Number of observations | 4127                  | 4127                  | 4127                  |

Note: \*\*\* in the upper right corner of the numerical values indicate that they are significant at the confidence level of 1% and the numerical values in brackets are T values.

and adds the lag period of the explained variable as the explanatory variable into the test model for regression analysis. The results show that the significance level and positive and negative direction of the explanatory variable coefficient have not changed.

## 6. Research Conclusions and Countermeasures

### 6.1. Research Conclusions

Based on the data of China's A-share listed strategic emerging industry companies from 2011 to 2019, this paper discusses the impact of economic policy uncertainty on R&D innovation by theoretical analysis and empirical analysis, and draws the following conclusions: under the background of strategic emerging industries, economic policy uncertainty reduces the quality of information environment and makes companies prefer short-term and low-risk investment projects, and economic policy uncertainty inhibits R&D innovation. Finally, the influence of economic policy uncertainty on the R&D innovation of companies is significant in companies with different property rights and different company sizes, and the influence of economic policy uncertainty on R&D innovation of non-state-owned companies or small-scale companies is more obvious.

### 6.2. Countermeasures and Suggestions

The research conclusion of this paper has important reference value for the practice of government and company.

Economic policy is crucial to the sustainable development of strategic emerging industries, and the uncertainty of economic policy has a negative impact on R&D innovation of strategic emerging industries. However, economic policy will change with the complicated and changeable domestic and international economic situation. As the economist Zhou Qiren pointed out, facing the unpredictable uncertainty, government management departments need a set of systems, and the government needs to further improve the market business quality and break the rent-seeking phenomenon of political association privileges. Create a fully competitive, fair, transparent and open business system, for example, improve the property rights protection system and contract system, give full play to the market's role in resource allocation, and reduce the interference of government actions on the company's innovation activities. The top-level system design needs to maintain the continuity of basic policies and stabilize the company's innovation expectations. At the same time, the government management department further supervises the quality of accounting information of the company and improves the protection system for small and medium investors.

From the company's point of view, strategic emerging industries are the key nurturing and supporting projects of the government, and the government has issued many economic policies to support them. Therefore, strategic emerging industries are greatly affected by the uncertainty of economic policies, which is the systematic risk that inhibits R&D and innovation of strategic emerging in-

dustries, and it is inevitable for the company. However, the company has positive coping mechanisms at the micro level, such as strengthening corporate governance, internal control quality and other measures to alleviate information asymmetry and agency conflicts.

## 7. Further Research Directions

According to Zhou and Jiang [17], Economic policy uncertainty is the inevitable systemic risk of the company. In the face of unpredictable economic policies, the company does not just passively accept them. On the micro level, the company can actively implement relevant mechanisms to mitigate the impact brought by the uncertainties of economic policies. For example, the company can alleviate information asymmetry and agency conflict through sound accounting policies, good internal control and other mechanisms, and the company can also undertake more social responsibilities. However, this paper does not discuss how firms' micro policies respond to economic policy uncertainties. Therefore, the subsequent research of this paper can focus on how the internal mechanism of the company can mitigate the impact of economic policy uncertainty on the company's R&D innovation.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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