

Research on the Impact of Economic Policy Uncertainty on Enterprise Innovation—Based on the Mediation Effect Model

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Abstract: The article uses the data of A-share listed companies in Shanghai and Shenzhen stock exchanges from 2007 to 2017 to analyze the internal mechanism of economic policy uncertainty, corporate financialization and corporate innovation, and empirically studies the impact of corporate financialization on economic policy and the mediating effect in the relationship between certainty and enterprise innovation. The results show that economic policy uncertainty effectively promotes corporate innovation, and corporate financialization plays a significant mediating effect on the promotion of economic policy uncertainty to corporate innovation. The results of a regulated mediating effect model further show the mediating effect. There are heterogeneous characteristics among enterprises of different sizes, different ownership properties and different enterprise growth.

Keywords: Economic Policy Uncertainty; Enterprise Innovation; Enterprise Financialization; Intermediary Effect Model

1. Introduction

Technological innovation is the source power for the high-quality development of my country's economy and an important support for enhancing the overall national strength. The report of the 19th National Congress of the Communist Party of China pointed out that the high-quality development of my country's economy still faces outstanding practical problems such as weak innovation capabilities and low levels of the real economy. It emphasizes the unswerving implementation of the innovation-driven development strategy, and gradually establishes the A market-oriented technological innovation system with in-depth integration of industry. Academia and research will build a sound national innovation system, emphasize the needs to further deepen the reform of the financial system, continuously enhance the ability of financial services to serve the real economy and effectively prevent systemic financial risks. Under the background of the new era, the study of how micro-enterprises "exit from the virtual to the real" and enhancing their independent innovation capabilities are extremely important for the high-quality transformation and development of my country's macroeconomic. This paper mainly focuses on the theoretical analysis of the inherent logical relationship between economic policy uncertainty, corporate financialization and corporate innovation. Based on the intermediary effect of corporate financialization, this paper empirically tests the relationship between economic policy uncertainty, corporate financialization and corporate innovation. For the inner working mechanism, it further explored the adjustment mechanism of different enterprise scale, ownership nature and enterprise growth in the relationship between economic policy uncertainty and enterprise innovation with enterprise financialization as the intermediary effect^[1].

2. Research design

2.1 Sample selection and data sources

This article takes the A-share listed companies in Shanghai and Shenzhen stock exchanges from 2007 to 2017 as a research sample, and the original data is processed as follows: remove ST and ST companies; remove financial and real estate companies; remove wind and CSMAR databases that are missing Companies with financial data and corporate R&D innovation data; companies with serious data missing are eliminated; all continuous variables are Winsorize processing by 1%. The data in the article mainly comes from the Guotaian database (CS MAR), and some of the data are supplemented by the annual reports of listed companies, Wind, and Juchao Information Network. In the end, this paper obtains a total of 17,286 unbalanced panel observations in the enterprise-annual data^[2].

2.2 Variable definition

2.2.1 The explained variable

The explained variable is enterprise innovation (RDratio, Lnpatent). This paper measures enterprise innovation from two levels of innovation input and innovation output. The innovation input uses the company's R&D investment as a percentage of operating income (RDratio), and the innovation output draws on the practice of Fang et al. Out (Lnpatent) said that the number of patent applications granted by a company is increased by one and then the logarithm is taken.

2.2.2 Explain variables

The explanatory variable is economic policy uncertainty (EPU). This paper uses the economic policy uncertainty index to measure, which has been widely used by domestic and foreign scholars in the study of micro-firm behavior in recent years. This paper selects the monthly data of the China Economic Policy Uncertainty Index in the index, and uses the arithmetic average method to convert it into annual data^[3].

2.2.3 Intermediary variables

The intermediary variable is corporate financialization (Fin). This paper uses the ratio of the sum of various financial assets to the total assets at the end of the period to measure the trend of corporate financialization. Drawing lessons from the practices of Song Jun and Lu Yang, financial assets are specifically selected as transactional financial assets, net worth of available-for-sale financial assets, short-term Net investment, net long-term debt investment, net long-term equity investment, net held-to-maturity investment, etc. In addition, considering that modern real estate investment presents the characteristics of virtualization and independence, it is included in the measurement of financial assets. The above financial assets are added together and divided by the total assets of the enterprise at the end of the period to characterize the financialization of the enterprise^[4].

2.2.4 Control variables

Control variables learn from the common practices of domestic and foreign scholars, select company age (Age), company size (Size), TobinQ value (TobinQ), main business income growth rate (Growth), asset-liability ratio (Lev), equity concentration (Top1), the structure of leadership (Dual), the nature of ownership (State) and the proportion of independent directors (Indep) as control variables. In order to enhance the robustness of the empirical results, the industry fixed effects and annual fixed effects are further controlled^[5].

2.3 Model construction

In order to test the research hypothesis, this article refers to the research method of Wen Zhonglin to construct an intermediary model, which is as follows:

$$RD_{i,t} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 X_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Fin_{i,t} = \beta_0 + \beta_1 EPU_t + \beta_2 X_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$RD_{i,t} = \theta_0 + \theta_1 EPU_t + \theta_2 Fin_{i,t} + \theta_3 X_{i,t} + \varepsilon_{i,t} \quad (3)$$

Among them, i and t represent the company and time (years) respectively; RDi,t are the explained variables, which represents enterprise innovation including enterprise innovation input ($RDratio$) and enterprise innovation output ($Lnpatent$); EPU_t is the explanatory variable, which represents the economy Policy uncertainty; $Fin_{i,t}$ is an intermediary variable, representing the financialization of the enterprise, and $X_{i,t}$ is a set of control variables[6].

3. Empirical Analysis

This paper performs least squares (OLS) regression on model (1), model (2) and model (3) (see Table 1), and controls the fixed effects of industry and year. Considering that the research sample may have the problem of heteroscedasticity, this paper chooses the heteroscedasticity robust standard error when performing parameter estimation.

From column (1) of Table 4, it can be seen that the coefficient of EPU is significantly positive at the level of 5%, indicating that the greater the uncertainty of economic policy, the higher the investment in innovation of enterprises; at the same time, the coefficient of EPU in column (4) is 1% The level of is also significantly positive, indicating that economic policy uncertainty has a significant positive effect on enterprise innovation output, so Hypothesis 1a has been verified. It can be seen from column (2) that the coefficient of EPU is significantly positive at the level of 1%, indicating that the greater the uncertainty of economic policy has, the lower the degree of corporate financialization has. That is, the uncertainty of economic policy significantly inhibits the trend of corporate financialization, so hypothesis 2a is verified. Through comprehensive column (1), column (2) and column (3), it can be found that the coefficients of EPU and Fin are both significant, indicating that economic policy uncertainty promotes corporate innovation investment by restraining corporate financialization. And corporate financialization is due to economic policy uncertainty. Sexuality plays a part of intermediary role in promoting enterprise innovation investment. Similarly, in columns (2), (4) and (5), the coefficients of EPU and Fin are both significant at the level of 1%, which is similar to the impact of economic policy uncertainty on enterprise R&D investment, indicating that economic policy uncertainty also promotes corporate innovation output by restraining corporate financialization. And corporate financialization plays a part of the intermediary role in promoting corporate innovation output by economic policy uncertainty. Therefore, economic policy uncertainty promotes corporate innovation by inhibiting corporate financialization, and corporate financialization plays a part of the intermediary role in economic policy uncertainty promoting corporate innovation. Hypothesis 3a has been verified^[7].

	(1)	(2)	(3)	(4)	(5)
	Rdratio	Fin	Rdratio	Lnpatent	Lnpatent
EPU	0.0013** (2.0502)	-0.0039*** (-3.9890)	0.0011** (1.9962)	0.1535*** (7.7110)	0.1517*** (7.6098)
Fin			-0.0078** (-2.1177)		-0.4785** (-2.4998)
Size	-0.0003 (-1.5125)	0.0022*** (5.6354)	-0.0003 (-1.3620)	0.5750*** (52.1954)	0.5761*** (52.2319)
Age	-0.0024*** (-5.3123)	0.0154*** (17.0222)	-0.0023*** (-5.0858)	-0.2459*** (-9.6095)	-0.2385*** (-9.2282)
Top1	-0.0050*** (-4.4087)	-0.0146*** (-5.2412)	-0.0052*** (-4.5415)	-0.1064 (-1.5462)	-0.1134* (-1.6470)
Board	-0.0007 (-0.7660)	-0.0160*** (-7.2979)	-0.0008 (-0.8697)	-0.1868*** (-3.6251)	-0.1945*** (-3.7669)
Dual	0.0007* (1.8743)	-0.0008 (-0.9035)	0.0007* (1.8745)	0.0782*** (3.5882)	0.0779*** (3.5708)

Tobinq	0.0020*** (14.9733)	-0.0015*** (-5.6681)	0.0020*** (14.8599)	0.0200*** (3.0037)	0.0193 (2.8898)
Growth	-0.0002 (-0.5515)	-0.0026*** (-9.4091)	-0.0002 (-0.6199)	0.0385* (1.7396)	0.0373* (1.6851)
Lev	-0.0002 (-0.1962)	-0.0247*** (-9.4091)	-0.0004 (-0.3650)	0.0233 (0.3952)	0.0115 (0.1944)
State	0.0009** (2.0545)	0.0032*** (3.1368)	0.0009** (2.0662)	-0.0717*** (-2.9870)	-0.0702*** (-2.9206)
cons	0.0132*** (2.7103)	0.0017 (0.1842)	0.0130*** (2.6750)	-10.3718*** (-39.1603)	-10.3710*** (-39.1445)
Industry	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
R2	0.1962	0.1006	0.1965	0.2786	0.2789
N	13171	17286	13171	17286	17286

Table 1. Benchmark regression results.

4. Conclusions

The research found in this paper: (1) Economic policy uncertainty promotes corporate innovation and is realized through the intermediary effect of corporate financialization, that is, economic policy uncertainty promotes corporate innovation by restraining the trend of corporate financialization. (2) The results of further moderated mediating effects show that the size of the firm has a limited moderating effect in the relationship between the uncertainty of economic policy and the input of corporate innovation with corporate financialization as the mediating variable[8]. The relationship between the uncertainty of economic policy and the innovation output of enterprises is significant, that is, the uncertainty of economic policy can inhibit the financialization of small-scale enterprises, increase the R&D investment of small-scale enterprises and inhibit the financialization of large-scale enterprises. Trends increase the output of innovative patents. (3) The nature of ownership plays a significant role in regulating the relationship between the uncertainty of economic policy and the innovation input and output of enterprises with corporate financialization as the intermediary variable. That is, the uncertainty of economic policy can more inhibit the financialization trend of state-owned enterprises. This, in turn, affects its R&D investment and innovation output. (4) The role of corporate growth is limited in the relationship between economic policy uncertainty and corporate innovation input with corporate financialization as the intermediary variable[9]. However, it has a limited effect on economic policy uncertainty and corporate innovation with corporate financialization as the intermediary variable. The moderating effect of the relationship between innovation and output is significant, that is, companies with poor growth are often more susceptible to policy uncertainty fluctuations caused by frequent economic policy adjustments and political changes, which will enhance the risk awareness of such companies and reduce financial Asset holding ratio to make them focus on corporate R&D and new product market operations. Therefore, the uncertainty of economic policy can restrain the financialization trend of enterprises with poor growth and increase their R&D investment, but it has not found a significant promotion effect on innovation output, and enterprises with better growth have better production and operation. As well as the ability to resist risks, the increase in economic policy uncertainty may not increase the proportion of enterprise innovation investment, but continuous R&D funds, personnel investment and good performance often create a stable internal environment for enterprise innovation activities, which is beneficial to enterprises Innovation output.

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