ISSN: 2710-0723

Economic Policy Uncertainty and Corporate Innovation Behavior

Wei Shao

Southeast University, Suzhou, Jiangsu, China

Abstract

This paper explores the impact of economic policy uncertainty on corporate innovation behavior. By integrating uncertainty theory, innovation theory, and real options theory, it constructs a comprehensive theoretical framework to explain how economic policy uncertainty affects corporate innovation decisions. Specifically, the paper posits that economic policy uncertainty influences corporate risk assessment, investment decisions, and option realization, ultimately having a profound impact on their innovation activities. This paper analyzes in detail the strategies that companies might adopt when facing economic policy uncertainty, including delaying investments, phased innovation investments, and diversified innovation investments. These strategies aim to minimize the risks brought about by policy uncertainty while maintaining the company's competitiveness and innovative capabilities in the market. Additionally, this paper proposes a series of hypotheses to further verify the specific impact of increased economic policy uncertainty on corporate innovation behavior. These hypotheses include: when economic policy uncertainty increases, companies will delay innovation investments; and in highly uncertain policy environments, companies tend to adopt diversified innovation investment strategies to spread risk. Finally, this paper provides valuable references from both corporate and governmental perspectives, helping corporate managers and policymakers formulate more effective innovation and management strategies in the context of economic policy uncertainty.

Keywords

Economic Policy Uncertainty; Corporate Innovation Behavior; Real Options Theory.

1. Research Background

In the wake of the COVID-19 pandemic, the world economy has taken on complex and volatile features. First, the drivers of growth have changed, with the rapid rise of new economic forms such as digital economy and e-commerce, which have become new engines of economic growth. At the same time, traditional industries such as tourism and manufacturing have been hit hard and the recovery process has been slow. Second, global inflationary pressures are rising. Supply chain disruptions, rising raw material prices and labor shortages have led to rising inflation around the world, with many countries experiencing levels not seen in years. Central banks face a difficult balancing act between controlling inflation and supporting economic recovery. At the same time, global supply chains are being restructured. Global supply chains have been hit hard during the pandemic, leading to production delays and higher costs. In order to reduce the risk, many countries began to promote the regionalization and localization of supply chains, reducing the dependence on a single country or region.

The complexity of the economic situation increases the degree of uncertainty. The uncertainty starts with macroeconomic policy. In the early days of the epidemic, governments generally adopted large-scale fiscal stimulus and loose monetary policies, including direct subsidies, tax breaks and public investment. These measures supported economic recovery in the short term, but they also led to higher fiscal deficits, higher debt levels and higher inflation. Countries have had to start tightening monetary and fiscal policy, gradually raising benchmark interest rates

ISSN: 2710-0723

to control price rises. In addition, uncertainty about the international governance system is growing. Major power competition, regional conflicts, challenges to the effectiveness of international organizations and multilateral mechanisms, fluctuations in society and public opinion, and the threat of security and terrorism have further increased the complexity and difficulty of global governance.

In the face of economic policy uncertainty, companies usually face two distinct strategic choices: one is to adopt a conservative strategy to avoid risk. Companies that take a conservative approach tend to cut costs, reduce investment and keep cash flow steady in response to possible market volatility and policy changes. This strategy aims to ensure that a business can maintain its basic viability in an uncertain environment by reducing operational risk and financial stress. Such companies may hold off on expansion plans to focus on their core business and avoid venturing into new markets or areas. The second is to increase investment in innovation to improve competitiveness and market share. Some enterprises choose to increase innovation investment in the uncertainty in order to occupy a favorable position in the future market competition. These companies are likely to devote more resources to research and development, drive digital transformation, and explore new technologies and new business models to improve production efficiency and customer satisfaction. In this way, they hope to seize opportunities quickly and leapfrog when stability returns to the market. Such enterprises usually have a high risk tolerance and forward-looking strategic vision, and are willing to bear greater uncertainty in the short term in exchange for long-term competitive advantage. Supply chain restructuring has also prompted companies to explore new supply chain management models and partners to enhance supply chain resilience and sustainability. In the face of economic policy uncertainty, the strategic choice of an enterprise is not only related to its own survival and development, but also has a profound impact on the dynamic changes of the entire industry and economy. Therefore, it is of great significance to study the decision-making behavior and effect of enterprises under the uncertain economic policy environment for understanding the economic operation mechanism and formulating effective policy measures.

2. Literature Review

2.1. Economic Policy Uncertainty

Economic Policy Uncertainty refers to the uncertainty caused by policy changes, government decisions or political environment turbulence. EPU will affect the decision-making behavior of enterprises and consumers, and then have a wide impact on economic growth, investment, employment and so on. Although the concept of economic policy uncertainty has been around for a long time, systematic research and quantitative analysis began in the late 2000s and early 2010s. After the 2008 global financial crisis, academics and policymakers began to pay more attention to the impact of policy uncertainty on the economy. In 2016, Nicholas Bloom of Stanford University, Steven J. Davis and Scott R. Baker of the University of Chicago and other scholars first proposed the economic Policy Uncertainty Index. By analyzing policy-related keywords in newspaper articles, tax law changes, and government expenditure forecast errors, the EPU index is constructed to reveal the significant impact of policy uncertainty on economic activities. The economic policy uncertainty Index consists of three parts: The first part is the News Index, which measures the uncertainty of economic policy by counting the number of articles related to economic policy uncertainty in 10 large American newspapers. The second part is the Tax Expiration Index, which measures the uncertainty of tax law changes by counting the number of tax laws that expire each year. The third part is the Economic Forecaster Disagreement Index, It is also divided into CPI Disagreement and Federal/State and Local Government Expenditure Disagreement, which measures the uncertainty of economic policy by examining the differences in the forecasts of different forecasters for important economic

ISSN: 2710-0723

indicators. The EPU Overall Index is the weighted sum of the four subindexes above, namely 1/2 News index, 1/6 Tax law lapse index, 1/6 CPI forecast difference, and 1/6 federal/local state government spending forecast difference.

The EPU index was initially applied to the US economy and has since been extended to other countries and regions. Using a similar approach, the researchers constructed EPU indices for multiple countries to further validate the impact of policy uncertainty on the global economy. For example, major economies such as the eurozone, Japan, and China have established their own EPU indices. With the wide application of EPU index, the research on the uncertainty of economic policy has been deepening. Throughout the existing literature, many scholars agree that economic policy uncertainty has a negative impact on the macro economy. These impacts are not only manifested in that the rise of economic policy uncertainty aggravates the volatility of key macroeconomic variables and financial asset variables, which affects the economic cycle (Villaverde et al.,2015; Pastor & Veronesi, 2012; Born & Pfeifer, 2014) also shows that the impact brought by economic policy uncertainty negatively affects output, employment and other macro variables, hindering economic recovery (Baker et al., 2012, 2016). At the same time, some scholars began to pay attention to the impact of economic policy uncertainty on the business activities of micro-enterprises (Julio & Yook, 2012; Gulen & Ion, 2016; Kang et al., 2014).

Th research covers the influence of policy uncertainty on investment decision, consumption behavior, financial market fluctuation, enterprise innovation, transnational capital flow and so on. A growing body of empirical research shows that policy uncertainty can lead businesses to delay investment, consumers to spend less, and financial market volatility to increase, thus restraining economic growth. The research results of economic policy uncertainty have been paid more and more attention by policy makers. When formulating and adjusting economic policies, governments are beginning to pay more attention to the transparency and predictability of policies to reduce the negative impact of uncertainty on the economy. For example, the US Federal Reserve and the European Central Bank have placed greater emphasis on transparency in their monetary policy communications, seeking to reduce market uncertainty.

2.2. Corporate Innovation Behavior

Innovation refers to the introduction of new products, services, processes, business models, or management methods to enhance the competitiveness of an enterprise. Joseph Schumpeter first proposed the concept of innovation, which he classified into five categories: new products, new processes, new markets, new resources, and new organizational forms. This categorization laid the foundation for subsequent research. Innovation is the source of economic growth, and for enterprises, their innovative behavior is driven by a variety of factors, including market competition, technological progress, internal resources and capabilities, etc., and innovation is the means by which an enterprise obtains market power and excess profits. Schwartz (2003) regarded R&D investment as an ordinary capital investment activity, and his research results showed that economic policy uncertainty inhibits capital investment. Fluctuations in the degree of economic policy uncertainty negatively affect firms' innovative behavior from several perspectives: first, because innovative projects usually require large capital investments but have long payback periods, firms are more inclined to retain cash flow to cope with potential uncertainty when the degree of economic policy uncertainty increases; second, the increase in the degree of economic policy uncertainty also increases the volatility of the financial market, which results in a Secondly, increased economic policy uncertainty also increases the volatility of the financial market, leading to higher financing costs, which makes enterprises more cautious and conservative in their investment in innovation and may reduce their investment in innovative behaviors; In addition, increased economic policy uncertainty makes the market

ISSN: 2710-0723

demand expectations unstable, and it is difficult for enterprises to accurately predict the future demand of the market, so they may choose a conservative strategy and reduce their investment in the development of new products and technologies to avoid potential risks; Finally, the innovative behaviors of enterprises are often Finally, firms' innovation behavior often relies on government policy support, such as R&D subsidies and tax incentives, etc. When the level of economic policy uncertainty increases, firms are not sure whether these support policies will continue and be effective in the long run, which may affect their innovation investment decisions.

Although the vast majority of studies agree that uncertainty negatively affects firms' innovation, Knight (1921) asserts that uncertainty is the only source of firms' profits, and that if all future changes can be predicted, then firms' profits disappear. Bloom (2007) points out that the adjustment cost characteristics of R&D investment are different from those of ordinary capital investment, and therefore the impact of economic policy uncertainty will affect the two differently. When faced with market competition and risk, firms may tend to accelerate innovation to increase market power under certain conditions, while economic policy uncertainty exacerbates market risk, which may cause firms to further increase innovation investment to retain or regain market power and cope with the changing policy environment. At the same time, risks are often accompanied by opportunities, and economic policy uncertainty may create new market opportunities that push firms to innovate in order to gain a competitive advantage.

In summary, economic policy uncertainty significantly affects corporates' innovation behavior by influencing their investment decisions and risk preferences. How the fluctuation of economic policy uncertainty affects orporates' innovative behavior requires further research.

3. Theoretical Analysis

Based on uncertainty theory, innovation theory, and real options theory, this paper constructs a comprehensive theoretical analysis to explain how economic policy uncertainty affects corporate innovation behavior.

Real options theory posits that the core of investment decision-making lies in the irreversibility of investment decisions, the uncertainty of future returns, and the ability to choose the timing of investments. The interaction among these three characteristics of most investment decisions determines the optimal decision for investors. Real options theory emphasizes the importance of maintaining flexibility and the ability to adapt to changes in an uncertain environment.

According to real options theory, when economic policy uncertainty increases, firms may adopt the following innovation behaviors:

1) Delaying Innovation Investment: Given the irreversibility of investment actions and the uncertainty of investment returns, firms might choose to delay innovation investments to wait for more market information or a clearer policy environment to reduce risks. Real options theory highlights the value of the option to choose in the face of economic policy uncertainty. In a high-uncertainty environment, delaying innovation investments can be seen as a "waiting option," granting firms the right to invest under more favorable conditions in the future. In this context, firms can retain the option to wait when information is incomplete or policies are uncertain, and proceed with innovation activities once the economic policy and market environment become clearer, leading to more informed decision-making.

2) Phased Innovation Investment: In an environment of increased economic policy uncertainty, the macro environment becomes more unpredictable, significantly raising the risk of innovation investment decisions. To cope with this uncertainty, real options theory provides an effective framework. Although future returns on investments are uncertain, firms can choose the timing of investments, granting them the flexibility to select and adjust investment plans in

ISSN: 2710-0723

the future. Specifically, firms can adopt a phased investment strategy, breaking down large-scale innovation projects into multiple smaller, manageable investment stages. By investing in phases, firms can evaluate the latest policy information and market conditions at the end of each stage, deciding whether to continue, adjust, or terminate subsequent innovation investments. This approach maximizes investment returns while minimizing potential losses.

3) Diversified Innovation Investment: Real options theory underscores the importance of diversifying investment risks in the context of increased economic policy uncertainty. Through diversified innovation investments, firms can invest in multiple different projects and technological fields. Each innovation investment project can be viewed as an option, granting firms multiple "real options," allowing them the flexibility to choose and adjust innovation investments. Firms can decide to continue, adjust, or terminate innovation projects based on changes in economic policies and market conditions, thereby reducing the negative impact of the failure of a single project on the overall enterprise.

In summary, according to real options theory, when economic policy uncertainty increases, firms can adopt various investment strategies such as delaying innovation investments, phased innovation investments, and diversified innovation investments to spread risks, realize option value, utilize the value of waiting options, or obtain multiple options. This enables firms to gather more market information, enhance adaptability, seize market opportunities, maintain flexibility and adaptability, and thus optimize investment decisions and innovation behavior in an uncertain environment.

4. Hypotheses

Based on the aforementioned theoretical framework, this paper proposes the following hypotheses:

Hypothesis 1: When economic policy uncertainty increases, firms' innovation investments will decrease.

Hypothesis 2: When economic policy uncertainty increases, firms tend to adopt diversified innovation investment strategies to spread risk.

Hypothesis 3: When economic policy uncertainty increases, firms' internal management and organizational behaviors will adjust to enhance their ability to cope with uncertainty.

5. Conclusion and Suggestions

Corporate innovation investment behavior exhibits a high degree of firm-specificity and investment irreversibility, which aligns closely with the "irreversibility of investment" premise in real options theory. Therefore, from the perspective of real options theory, this paper constructs a comprehensive theoretical framework to explain the impact of economic policy uncertainty on corporate innovation behavior. According to real options theory, this paper analyzes several types of innovation investment behaviors that firms may adopt under increased economic policy uncertainty and reveals the mechanisms of real options theory: to realize option value, utilize the value of waiting options, or obtain multiple options, firms may delay innovation investments, adopt flexible phased innovation investments, or pursue diversified innovation investments. These strategies allow firms to wait for more policy-related information disclosure and choose appropriate investment timing, thereby reducing the investment risks posed by macroeconomic fluctuations.

Economic policy is a crucial tool for government macroeconomic regulation, and adjustments in current macroeconomic policies can significantly impact various aspects of corporate operations. For firms, under increased economic policy uncertainty, optimizing innovation investment decisions based on real options theory is essential. Specifically, firms can choose to

ISSN: 2710-0723

delay investments, implement phased or diversified innovation investment strategies, enhance information gathering and market analysis, dynamically adjust investment portfolios, increase organizational flexibility and adaptability, and establish robust risk management mechanisms to enhance overall competitiveness.

For the government, since increased economic policy uncertainty negatively affects corporate innovation behavior, measures should be taken to create a favorable external economic environment. This includes enhancing the stability, continuity, and sustainability of policies, formulating a policy framework that supports innovation, increasing efforts in policy interpretation, and stabilizing market expectations. These actions can mitigate the negative impact of economic policy fluctuations on corporate innovation investments, thereby enhancing the overall innovation capacity and competitiveness of the economy.

References

[1] Baker, S. R., N. Bloom, and S. J. Davis, 2012, "Has Economic Policy Uncertainty Hampered the Recovery?", Chicago Booth Research Paper, No. 12-06.

[2] Baker, S. R., N. Bloom, and S. J. Davis, 2016, "Measuring Economic Policy Uncertainty", Quarterly Journal of Economics, 131: 1593 -1636.

[3] Bloom, N., 2007, "Uncertainty and the Dynamics of R&D", American Economic Review, 97(2): 250-255.

[4] Bloom, N. , S. Bond, and J. V. Reenen, 2007, "Uncertainty and Investment Dynamics ", Review of Economic Studies, 74:391-415

[5] Born, B., and J. P feifer, 2014, "Policy Risk and the Business Cycle", Journal of Monetary Economics, 68: 68-85.

[6] Gulen, H., & Ion, M. (2016). Policy Uncertainty and Corporate Investment. Review of Financial Studies, 29(3), 523–564.

[7] Hoang, K., Quang Thi, T. N., & Nguyen, C. (2023). Start-up firms' investments: When economic policy uncertainty matters? Management Decision, 61(5), 1065-1089. doi:https://doi.org/10.1108/MD-08-2021-1094.

[8] Knight, F. H. , 1921, "Risk, Uncertainty and Profit", Houghton Mifflin Company, 4: 682-690.

[9] Pastor, L., and P. Veronesi, 2012, "Uncertainty about Government Policy and Stock Prices", Journal of Finance, 67(4): 1219-1264.

[10] Schumpeter, J. "Creative Destruction. "Capitalism, Socialism and Democracy, 1942, pp. 82-85.

[11] Schwartz, E., 2003, "Patents and R&D as Real Options", NBER Working Paper 10114.

[12] Villaverde, J. F., P. G. Quintana, K. Kuester, and J. R. Ramírez, 2015, "Fiscal Volatility Shocks and Economic Activity", American Economic Review, 105(11): 3352-3384.