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Measures for Investment Risk Management of Enterprise Technological Innovation Projects

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Abstract: Enterprise technological innovation project investment risk management refers to the enterprise taking a series of measures to manage and control possible investment risks when making technological innovation project investment decisions. Investment risks in technological innovation projects refer to various risks that may have a negative impact on investment due to the uncertainty of technological innovation and changes in the market environment. This article, from an industry professional perspective, analyzes and discusses measures for investment risk management of corporate technological innovation projects.

Keywords: Innovative projects; Investment risks; Management measures

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1. Introduction

In the current business environment, companies face investment risks when promoting technological innovation projects. Due to the uncertainty and complexity of technological innovation projects, investors need to be aware of the existence of project investment risks. Project investment risks involve many aspects, including uncertainty in market demand, technical feasibility risks, competitive pressure, policy environment, and so on. Therefore, understanding and managing these risks is critical to business success. The purpose of this study is to explore measures for enterprise technological innovation project investment risk management and provide effective management suggestions for enterprises. Analyzing and evaluating different investment risks can help companies determine appropriate strategies and measures to deal with risks and increase the likelihood of project success. In addition, studying the practical experience of enterprise technological innovation project investment risk management can provide academic circles with discussions on the theories and methods of risk management. Therefore, this research has important significance and application value.

2. Overview of investment risks in enterprise technological innovation projects

2.1. Characteristics of technological innovation projects

Technological innovation projects refer to projects carried out by enterprises to promote technological progress

and enhance competitiveness. They usually have the following characteristics. High uncertainty: Technological innovation projects usually face a variety of uncertainties, including technical feasibility, market demand, business models, and so on. Immature technologies and uncertain market conditions may lead to project failure. Therefore, when conducting technological innovation projects, it is necessary to conduct sufficient market research and technical verification, reduce uncertainty, and promptly adjust the direction and strategy of the project. Long-term investment return: Technological innovation projects often take a long time to achieve commercial operation and profitability. This is because technological innovation often requires a series of steps such as research and development, testing, and verification, and it also takes time to increase market acceptance. Therefore, before starting a technological innovation project, companies need to be prepared for long-term investment, including investment of funds, human resources, and time. Complicated technical requirements: Technical innovation projects usually require the mastery and application of new technologies and knowledge. This requires companies to have relevant technical capabilities and expertise, or to establish cooperative relationships with partners to make up for their technical shortcomings. In addition, technological innovation projects also need to conduct technical risk assessment and management to ensure that the project can be effectively applied and implemented.

2.2. Classification and assessment methods of investment risks in technological innovation projects

Investment risks in technological innovation projects can be classified according to their nature and degree of impact. Common classifications include the following. Technical risk, which refers to the potential risks faced by enterprises in the process of developing and applying new technologies. This risk may arise from factors such as insufficient technological maturity, lack of patent protection, and high technical difficulty. Market risk, which refers to the risks that an enterprise's products or services face in the market, mainly including factors such as market demand fluctuations, fierce competition, improper business models, and so on. Businesses need to understand and respond to market risks to remain competitive. Operation and management risks are the risks related to the internal operation and management of the enterprise, such as poor organizational management, loss of human resources, unstable partner relationships, and so on. Effective organizational management and human resource management are crucial to the long-term development of an enterprise. Funding risk: Enterprises often focus too much on long-term investment and ignore the management of working capital, resulting in poor capital turnover, idle funds, or short-term capital shortages [1]. Funding risks mainly include risks in the raising, use, and return of project funds. Enterprises need to rationally plan capital operations to ensure the effective use of funds and the sustainable development of projects. The distribution trends of technical risk (a), market risk (b), operation and management risk (c), and financial risk (d) at each stage are shown in **Figure 1**.

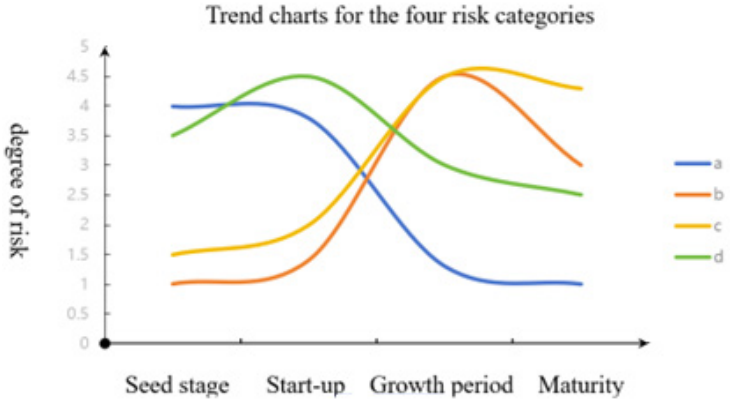

Figure 1. Trend chart of four types of risks

The core risk factors of an enterprise usually refer to those risk factors that are most likely to have a significant impact on the operation and development of the enterprise (**Figure 2**). These risk factors may vary depending on the industry, enterprise size, and business model. They mainly include the above four types, as well as policy and regulatory risks, and so on. There are many methods to assess investment risks in technological innovation projects, and commonly used methods include the following. Expert assessment method: Evaluate and predict various risk factors of technological innovation projects through the experience and knowledge of an expert team or professional consultants. Based on their industry experience and professional knowledge, combined with a deep understanding of the market, technology, and management, experts can identify, evaluate, and make recommendations on the risks that the project may face, providing an important reference for decision-makers. Statistical model method: Through historical data and statistical models, various risk factors of technological innovation projects are quantified and simulated to obtain risk indicators and probability distributions. This method can help companies more objectively assess the risk level of projects and provide data support and a decision-making basis. Scenario analysis method: By constructing different development scenarios and assumptions, analyze and predict different risk scenarios that technological innovation projects may face. This method can help enterprises conduct risk assessments under multiple possibilities and help formulate corresponding risk management strategies and plans.

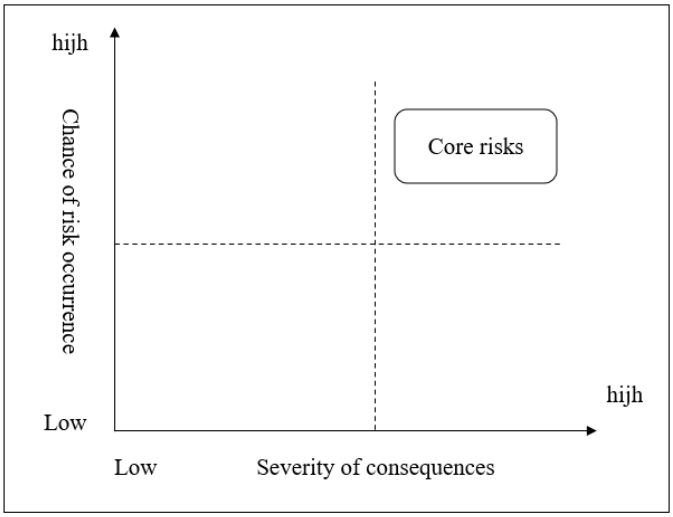

Figure 2. Risk type determination chart

2.3. The role and value of risk management in technological innovation projects

When enterprises carry out innovation activities, investment decisions run through the entire innovation process. It is crucial to effectively identify innovation investment risks and make innovation investment decisions more scientific. Therefore, risk management plays a key role in technological innovation projects, which can help companies reduce risks and increase the probability of project success. Its main functions and values include the following. Predict and identify risks: Through risk management methods and tools, enterprises can predict and identify various risks that projects may face, and discover potential risk points early. Assess and quantify risks: Risk management can help companies evaluate and quantify various risk factors of the project and derive risk indicators, thereby helping companies better understand the risks faced by the project. Develop risk response strategies: Risk management can help enterprises formulate corresponding risk response strategies and measures, reduce the possibility of risk occurrence, and respond to existing risks promptly. Monitor and

control risks: Risk management can help enterprises establish risk monitoring and control mechanisms, detect and respond to risk events on time, and reduce the impact of risks on projects. In short, when enterprises invest in technological innovation projects, they must recognize the risks they face and take corresponding risk management measures to increase the probability of project success.

3. Analysis of investment risk management measures for enterprise technological innovation projects

3.1. Risk avoidance and control measures

3.1.1. Risk control strategy during the technical verification and testing phase

During the technical verification and testing phase, a series of measures should be taken to control risks. For example, establish a strict technical verification process to ensure the completeness and accuracy of technical verification; carry out standardized experimental design and execution to reduce risks that may arise during the experimental process. Big data, artificial intelligence, and machine learning technologies can also be used to analyze historical data, identify potential risk patterns and trends, and predict possible future risk events based on risk models to provide a scientific basis for decision-making [2].

3.1.2. Risk avoidance in contract management and supply chain management

During the project implementation process, it is necessary to sign contracts with external partners and conduct contract management. The responsibilities and obligations of each party should be clearly defined in the contract to avoid contract performance risks. In addition, the management of key suppliers and supply chains also needs to strengthen risk control to ensure the stability and quality of supply.

3.1.3. Risk control of project management and communication

Project management and communication are important aspects of risk control. An effective project management system should be established, including goal setting, progress management, resource allocation, and so on, to reduce project risks. At the same time, it is necessary to strengthen communication with team members and relevant stakeholders, solve problems and risks promptly, and maintain smooth flow and transparency of information.

3.1.4. Financial risk control strategy

During project implementation, financial risks need to be reasonably planned and managed. For example, formulate financial budgets and capital plans to ensure adequate and effective use of project funds; establish a risk management mechanism to monitor and evaluate project financial risks, and take appropriate measures to respond and control promptly. In addition, an enterprise's strategy is closely related to its finances, so strategic risk control can be measured from a financial synergy perspective [3].

3.1.5. Human resources risk control strategy

Human resources are a key factor in project success, so effective risk control is required. For example, formulate recruitment and training plans to ensure that the structure and capabilities of the project team meet project needs; establish performance evaluation and incentive mechanisms to stimulate the enthusiasm and creativity of team members, and conduct team-building activities to enhance team cohesion and cooperation.

3.1.6. Safety risk control strategy

During project implementation, it is necessary to pay attention to the control of safety risks. For example,

establish a safety management system and operating procedures to ensure the safe operation of the project; carry out safety training and education to improve the safety awareness and emergency response capabilities of team members; monitor and evaluate safety risks, and take corresponding risk control measures on time.

3.2. Measures for risk transfer and sharing

3.2.1. Utilization of insurance and guarantees

Enterprises can purchase corresponding insurance to transfer risks, such as property insurance, liability insurance, and so on. In addition, additional guarantees can be obtained through the support of guarantee institutions to improve the project's financing capabilities and creditworthiness.

3.2.2. Establishment and cooperation of partnerships

Establishing partnerships with partners with corresponding technology or market resources can expand the company's technological innovation capabilities and market influence, and reduce the risks of a single project. By sharing risks and resource investment, the success rate and benefits of the project can be improved.

3.2.3. Financing methods and risk sharing in the capital market

Enterprises can raise funds through the capital market and transfer part of the risks to investors. For example, through stock issuance, bond issuance, and so on, investors can be attracted to participate in project capital investment and risk sharing, thereby reducing the financial pressure and risk burden of enterprises.

4. Evaluation of investment risk management measures for enterprise technological innovation projects

4.1. Evaluation of the advantages and disadvantages of existing measures

When evaluating existing investment risk management measures for enterprise technological innovation projects, their advantages and disadvantages need to be comprehensively considered. Advantages include the following. Identify risks in advance: Existing investment risk management measures can help companies identify possible risks in projects in advance, thereby reducing losses caused by risks. Effectively manage risks: By formulating a risk management plan and taking corresponding measures, project risks can be effectively managed and controlled and the negative impact of uncertainty can be reduced. Improve project success rate: Investment risk management measures can help companies improve the success rate of technological innovation projects and increase their competitiveness and market share. Disadvantages include the following. Inaccurate risk assessment: Existing risk assessment methods may have a certain degree of subjectivity and uncertainty, leading to inaccurate risk assessment results, which may affect project decisions and investment decisions. Insufficient control measures: Sometimes, existing investment risk management measures may not fully provide effective control measures, especially when dealing with complex technological innovation project risks. Lack of timely feedback: Existing investment risk management measures may have a certain lag in feedback and modification after the risk occurs, and cannot be adjusted and improved on time.

4.2. Challenges faced and improvement directions

4.2.1. Improvement of risk assessment methods

Improvement and research on existing risk assessment methods should be strengthened, and more scientific and objective methods should be used to assess the probability and impact of risks, to improve the accuracy and reliability of assessments. In addition, investment management systems and processes should be

regularly evaluated and improved to promptly adapt to market changes and corporate development needs, and continuously optimize and improve investment management work [4].

4.2.2. Strengthen control measures

The research and implementation of risk control measures for technological innovation projects should be strengthened, and corresponding control measures should be carried out for various risks to reduce the occurrence and impact of risks.

4.2.3. Strengthen information sharing and communication

Corporate management may lack an in-depth understanding of the operating mechanisms and investment tools of the financial market, making it difficult to grasp market dynamics and investment opportunities [5]. Information sharing and communication within and outside the enterprise should be promoted to better identify and manage risks in technological innovation projects.

4.2.4. Strengthen risk management and supervision

The negative impact of venture capital institutions on corporate financialization will usually be exerted through stronger corporate governance participation, thus reflecting a supervision channel [6]. Since venture capital institutions hold equity in the enterprise and participate in the management and decision-making of the enterprise, they usually supervise and manage the operation of the enterprise more closely. By strengthening risk management and supervision, investors can be ensured to obtain sufficient information and protection, and investment risks can be reduced [7]. Effective risk management and supervision systems help reduce investment risks and improve the soundness and sustainability of investments by identifying, evaluating, and controlling various risk factors, including market risks, credit risks, operational risks, and so on.

4.2.5. Strengthening social responsibility performance

Venture capital usually invests in start-ups or high-growth companies to obtain high returns. While pursuing profit maximization, sometimes companies may ignore their social responsibility performance. Some studies have confirmed that venture capital support is not conducive to the social responsibility performance of companies [8]. Therefore, the sustainable development and social impact of enterprises should be evaluated to ensure that the invested enterprises are not only profitable, but also comply with relevant laws and regulations, respect the environment, and care for their employees.

5. Conclusion

As an integral part of the innovation system, venture capital can not only provide financial support and post-investment management services to start-up enterprises but also promote the implementation of scientific and technological innovation activities. Although investment risk management of technological innovation projects will face higher requirements and challenges in the future, it will also usher in more opportunities and prospects. In the future, data-driven risk management will become mainstream, and companies can use technologies such as big data and artificial intelligence to improve risk prediction and decision-making accuracy. At the same time, cross-border cooperation and innovation will be valued, and risk management effects will be improved through cooperation with companies in other industries to share resources and experience. As technological innovation advances, the venture capital and insurance markets will also flourish, providing more products to meet the risk management needs of corporate technological innovation projects. These trends will push

investment risk management of technological innovation projects towards a more scientific and effective development direction, helping enterprises achieve sustainable growth and competitive advantage.

Disclosure statement

The author declares no conflict of interest.

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