Frontiers in Economics and Management Volume 7 Issue 4, 2026
ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

Research on the Construction of a Full Life Cycle Insurance Service System for Technology Enterprises

Chuanjia Zhang

Hebei University of Economics and Business, Shijiazhuang, Hebei, China

Abstract

Technology enterprises face high-risk, diverse, and uncertain challenges at different stages of their life cycle. Based on the enterprise life cycle theory, this paper analyzes the main risk characteristics and changes in insurance demand of technology enterprises in their startup, growth, and maturity stages. It points out that the current technology insurance service system suffers from problems such as a single insurance supply structure, an incomplete service system, and a mismatch between products and enterprise needs. In response to the characteristics of different development stages, this paper proposes policy recommendations for improving the technology insurance system, including establishing a risk compensation mechanism, encouraging insurance product innovation, promoting the development of new types of insurance, and improving cross-border insurance service support. At the same time, it emphasizes that technology enterprises should enhance their awareness of insurance use and risk management capabilities, proactively adapt to and utilize technology insurance services, and form a virtuous cycle of supply and demand coordination. The study concludes that constructing an insurance service system covering the entire life cycle of technology enterprises is an important guarantee for enhancing the resilience of my country's technological innovation and the high-quality development of its industries.

Keywords

Technology Insurance; Enterprise Life Cycle; Risk Management; Insurance Product Innovation; Policy Support.

1. Introduction

With the continuous development of the innovation-driven strategy, the importance of technological innovation has been amplified, and technology enterprises have become an important pillar of the construction of a modern industrial system. However, these enterprises face different risks at different stages of development, such as early-stage R&D failure risks, mid-stage market liability risks, and mature-stage management and environmental pollution risks. In January 2024, the State Financial Supervision and Administration Bureau issued the "Notice on Strengthening Financial Services for the Entire Life Cycle of Technology Enterprises," encouraging insurance institutions to develop new products for different stages of technology enterprise development to support their growth.[1] In September 2024, the State Financial Supervision and Administration Bureau issued the "Several Opinions on Strengthening Supervision, Preventing Risks, and Promoting High-Quality Development of the Insurance Industry," which pointed out the need to serve technological innovation and the construction of a modern industrial system, and to improve the insurance product and service system covering the entire life cycle of technology enterprises.[2] It is evident that the state attaches great importance to the development of technology insurance, and an insurance service system combining technology insurance with the entire life cycle is imperative.

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

However, the current technology insurance system is still incomplete. Insurance products are not designed to address the risks at each stage of a technology company's development, making it difficult for technology companies, especially startups and growth-stage companies, to obtain adequate protection. Furthermore, insurance companies have weak risk assessment capabilities for technology companies, and the companies themselves have relatively weak risk awareness, resulting in significant problems on both the supply and demand sides of technology insurance.

Based on this, this paper will explore how to establish a scientific and reasonable technology insurance system from the perspective of the entire life cycle of technology companies, focusing on four dimensions: insurance demand, current problems, institutional suggestions, and the adaptability of technology companies. This will provide theoretical support and practical insights for policy formulation and insurance product innovation.

2. Technology Company Life Cycle

2.1. Basic Stages of the Technology Company Life Cycle

The development of technology companies exhibits significant stage-specific characteristics. While each company may have its own unique characteristics during its development, generally speaking, its life cycle can be divided into three stages: startup, growth, and maturity.

In the startup stage, companies are often founded by technical teams or researchers, and are in the product development and technology verification stage. They have not yet achieved stable revenue. At this stage, companies mainly rely on external financing (such as angel investment and government subsidies) to maintain operations. Their organizational structure is not yet fully established, their management capabilities are relatively limited, and their risk tolerance is weak.

In the growth stage, as technology matures and is transformed into actual products or services, technology companies generally have initial profitability. However, they face new challenges in market expansion, organizational management, talent acquisition, and regulatory compliance, leading to an upgraded demand for insurance protection.

In the maturity stage, companies generally have established stable business models, customer bases, and profit structures, with some even achieving listing or multinational operations. However, the risks of mature companies do not decrease but become more complex, requiring insurance mechanisms to provide more professional and systematic support.

2.2. Theoretical and Practical Significance of Full Life Cycle Analysis

Approaching technology insurance from the perspective of the entire enterprise life cycle has rich practical significance and theoretical value.

First, the types of risks differ at each stage of a technology company's growth. If insurance services and products cannot adapt to this dynamic change, it will be difficult to truly play a role in risk transfer and mitigation.[3] For example, R&D failure insurance is significant for startups but may be worthless for mature companies; while cybersecurity insurance may be an "optional" for startups but a "must-have" for mature companies.

Secondly, only by adopting a full life-cycle perspective can insurance companies adapt to the needs of different stages in product development, pricing strategies, and customer service. This allows insurance to truly integrate into every stage of enterprise development and provide more comprehensive protection.

Finally, government policies also need to be tailored to the full life-cycle. Currently, local policies supporting technology insurance mainly focus on short-term incentives such as premium subsidies, lacking policy support covering the entire growth process of technology

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

enterprises. Adopting a full life-cycle perspective helps to shift policies from single-point support to systemic support, better realizing the policy's supportive and encouraging role.

3. Analysis of the Current Status and Problems of Technology Insurance

3.1. Current Status of Technology Insurance Development in my country

According to the "Report on the Special Work of Insurance Industry Supporting Technological Innovation" issued by the State Financial Supervision and Administration Bureau, as of the end of 2023, pilot areas for technology insurance nationwide had provided insurance services to more than 500,000 technology-based enterprises, with a cumulative risk protection amount exceeding RMB 5.8 trillion. Among them, the insurance coverage rate for high-tech enterprises is approximately 22.75%, and the insurance coverage rate for specialized and innovative "little giant" enterprises is approximately 24.21%, both increasing by nearly 10 percentage points compared to 2018.

Meanwhile, local-level exploration is also accelerating. Taking Shenzhen as an example, in 2023, Shenzhen provided insurance protection for more than 3,200 small and medium-sized technology enterprises by establishing a special subsidy fund for science and technology insurance, with a cumulative risk protection amount reaching 70 billion yuan. Suzhou High-tech Zone, as one of the first batch of national science and technology insurance pilot areas, promoted the implementation of products such as intellectual property insurance and the first (set) of major technical equipment insurance. In 2023, its science and technology insurance premium income exceeded 1.2 billion yuan, a year-on-year increase of 25%. It can be seen that my country's science and technology insurance pilot work is progressing smoothly and has achieved great results, effectively reducing the R&D and marketization risks of technology enterprises and providing protection for the development of high-tech industries.

Nevertheless, most of the science and technology insurance pilot work is located in developed cities such as the Yangtze River Delta, the Pearl River Delta, and the Beijing-Tianjin-Hebei region, and the overall penetration rate of science and technology insurance nationwide is still relatively low. According to the "Blue Book on the Development of Science and Technology Insurance (2023)" released by the Insurance Association of China, the insurance coverage rate for early-stage technology companies is less than 15%. Most small and medium-sized technology enterprises still rely primarily on self-assumption of risk, exhibiting weak insurance awareness and insufficient matching of insurance products, which has become a major obstacle to the further development of science and technology insurance. Furthermore, the science and technology insurance product system is still imperfect, professional service capabilities need improvement, and insurance companies lack the ability to assess and price risks for technology companies, resulting in a significant structural contradiction between supply and demand in the market.

3.2. Major Problems with Current Technology Insurance

The insurance needs of technology companies are characterized by phased and diversified nature. However, the existing technology insurance market still has many shortcomings in terms of supply structure, product design, and service capabilities, failing to protect companies throughout their entire life cycle and address the risks they face.[4]

In the early stages, the biggest problem facing technology insurance is "insurance inaccessibility." Because startups lack stable revenue and a clear asset structure, risk identification is relatively more difficult than for ordinary companies. Insurance companies often struggle to accurately assess their payout probability, thus choosing to avoid underwriting. This results in a severe shortage of insurance products needed by startups, such as R&D failure insurance and intellectual property insurance. At the same time, many startups

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

have limited understanding of insurance and lack the awareness and ability to proactively purchase insurance. Even if insurance products are available, they often forgo them due to high costs and complex claims mechanisms. At the policy level, support for startup insurance is mostly limited to subsidies, lacking corresponding mechanisms to guide insurance institutions into high-risk markets.

In the growth stage, the mismatch between insurance supply and demand is particularly prominent. As businesses grow and expand, their need for managing risks such as product liability, employment management, and operational disruptions increases. However, many insurance products currently available on the market primarily cover traditional industries, failing to adequately address the specific risk characteristics of technology companies. For example, many product liability insurance policies do not cover the legal risks of new business models such as software services and platform operations, potentially leaving technology companies without protection even if they purchase insurance. Furthermore, small and medium-sized technology companies often lack the resources or management expertise to access professional insurance advisors or intermediaries, hindering the development of sound risk transfer strategies and preventing insurance from effectively proactively planning and mitigating risks.

As technology companies mature, their insurance needs shift to deeper areas such as corporate governance, capital markets, and information security. However, the current insurance market lags behind in these areas. On one hand, new types of insurance, such as directors and officers liability insurance, cybersecurity insurance, and environmental liability insurance, developed relatively late in China, resulting in low product maturity, complex application processes, opaque pricing mechanisms, and inadequate service capabilities of insurance companies to meet evolving business needs. On the other hand, some large technology companies face issues such as data privacy and compliance constraints during the insurance process, lacking an institution that can both protect trade secrets and reasonably assess risks. Furthermore, there is currently no systematic cross-border insurance support service to address the differences in legal and insurance systems faced by technology companies operating internationally, hindering cross-border risk protection during their internationalization process.

my country's technology insurance is still in a fragmented supply and passive protection stage in terms of providing services throughout the entire lifecycle of technology companies, making it difficult to achieve genuine risk sharing and development support.

4. Policy Recommendations for Improving the Technology Insurance Service System

To address the different risks faced by technology companies at different stages of their life cycle and the various problems in existing technology insurance, building a technology insurance system covering the entire life cycle requires starting from multiple angles, such as institutional guarantees and service capacity building, to promote the upgrading of technology insurance from a single protection to a systematic service system.

4.1. Insurance Support Policies for Start-up Companies

For start-up technology companies, a more inclusive policy incentive mechanism needs to be established to encourage insurance companies to proactively enter early-stage high-risk areas.[5] On the one hand, the government can establish a "technology insurance risk-sharing fund" to provide reinsurance support or risk sharing for insurance companies to carry out high-risk insurance products such as R&D failure insurance and intellectual property insurance, thereby reducing the concerns of insurance institutions to carry out related businesses. On the other hand, financial support for insurance for start-ups should be strengthened to increase

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

their willingness to purchase insurance. For example, through a premium subsidy mechanism of "government funding + enterprise self-payment", enterprises can be guided to try purchasing technology insurance products. At the same time, the deep integration of insurance and business incubation services can be promoted, and technology insurance service points can be set up in science parks and industrial bases to provide enterprises with supporting services such as consulting, product customization and risk assessment.

4.2. Product Innovation and Service Optimization for Growth-Stage Enterprises

For growth-stage technology enterprises, policies should focus on solving the structural mismatch between insurance products and the actual needs of enterprises. First, insurance companies should be encouraged to strengthen their research on the characteristics of the technology industry in product design, and promote the launch of liability insurance products for emerging business forms such as platform-based, software-based enterprises and artificial intelligence algorithm products. Second, the risk advisory mechanism for small and medium-sized technology enterprises should be improved, and support should be given to the establishment of insurance intermediary service platforms specifically for technology enterprises, providing one-stop services such as insurance advice, product comparison, and claims assistance to help enterprises scientifically build a risk protection system.[6] In addition, it is also possible to explore incorporating insurance into the credit rating system for technology enterprises, giving preferential treatment to enterprises that purchase corresponding insurance products in financing and government procurement, and guiding enterprises to regard insurance as a risk management tool rather than a cost burden.

4.3. Development of Emerging Insurance Products and Cross-border Support for Mature Enterprises

For mature technology enterprises, it is recommended to strengthen the development of emerging insurance products and supporting systems, and promote insurance products to cover relevant risks. Currently, directors and officers liability insurance, cybersecurity insurance, and environmental liability insurance are mostly imported products, and there is a disconnect between the system and practice. It is recommended that the financial regulatory authorities take the lead in formulating unified product guidelines and risk assessment standards. Meanwhile, for technology companies conducting multinational business, the construction of a cross-border insurance service system should be promoted, and capable insurance institutions should be encouraged to establish international technology risk service centers to provide companies with risk protection solutions covering the legal systems of different countries.

In general, building an insurance service system covering the entire life cycle of technology companies should release the enthusiasm of insurance companies to participate in technological innovation through policy mechanisms, respond to the actual risks of enterprises through product innovation, and make technology insurance a true stabilizer and accelerator for the growth of technology companies.

5. Enhancing the Adaptability of Technology Companies to Technology Insurance Services

In the process of building a technology insurance service system covering the entire life cycle of technology companies, the effective supply of insurance products is certainly important, but the companies' own level of understanding and ability to use insurance is also an important part of whether the system can operate well. Technology insurance is different from general commercial insurance, involving multiple aspects such as corporate strategic planning, risk assessment, and personnel management. If technology companies cannot accurately identify

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

their own risks and scientifically allocate insurance resources, they will find it difficult to truly enjoy the protection effectiveness brought by technology insurance.[7] Therefore, from the demand side, promoting technology companies to enhance their risk management awareness and improve their insurance allocation capabilities is an indispensable part of improving the technology insurance service system. To address the risk characteristics at different stages of the life cycle, technology companies can adopt differentiated strategies and make reasonable use of insurance tools to enhance their overall risk resistance capabilities.

5.1. Insurance Configuration Recommendations for Start-up Companies

In the startup stage, companies typically have limited resources, and the focus should be on basic protection against key risks. It is recommended that company managers enhance their risk awareness and pay attention to "bottleneck" risks such as R&D failures and intellectual property disputes.

Prioritize insurance products directly related to core assets, such as R&D liability insurance and intellectual property insurance. At the same time, companies should make full use of various government resources, such as policy insurance subsidies in science parks and local science and technology insurance pilot projects, to reduce their own insurance costs. In addition, startups can also obtain professional insurance consultation and personalized solution suggestions through insurance institutions or service platforms to avoid the problems of buying the wrong insurance or lacking insurance.

5.2. Insurance Strategy Optimization for Growth-Stage Companies

In the growth stage, companies accelerate business expansion, and the risk dimensions expand accordingly. Insurance configuration should be more systematic and diversified. Enterprises should proactively establish dedicated risk control positions and, in conjunction with the advice of insurance advisors, build a comprehensive insurance protection system covering products, employees, finance, and operations. For example, purchasing product liability insurance before launching a product can help mitigate legal compensation risks arising from product defects. During the human resource expansion phase, enterprises should provide employees with employer liability insurance and group health insurance to improve employee satisfaction and organizational stability.

5.3. Risk Management for Mature Enterprises

In the mature stage, enterprises face more risk challenges from corporate governance, capital markets, and public liability. Enterprises should incorporate directors and officers (D&O) liability insurance into their corporate governance system to strengthen the risk awareness and decision-making responsibility of board members.[8] Simultaneously, appropriate cybersecurity insurance should be allocated based on the degree of business digitization and the sensitivity of customer data. For enterprises intending to expand their multinational business, it is recommended to actively engage with international insurance service providers to obtain overseas underwriting resources and reduce compliance and legal risks associated with multinational operations. Enterprises should also appropriately disclose insurance arrangements and risk management measures in their financial statements to enhance the confidence of investors and regulatory agencies.

Regardless of their stage of development, technology companies should consider insurance as a crucial means to ensure stable operations and enhance their resilience against risks. By scientifically allocating insurance coverage, proactively engaging with insurance services, and continuously optimizing their risk management systems, technology companies can better cope with the uncertainties brought about by market fluctuations and unforeseen events, thus achieving steady and sustainable development.

ISSN: 2692-7608 DOI: 10.6981/FEM.202604_7(4).0002

6. Conclusion

Technology enterprises play an important role in promoting high-quality development and accelerating technological self-reliance, but the types of risks they face are complex and varied, requiring more professional and systematic insurance services to support them.

This article analyzes the construction of an insurance service system that covers the entire life cycle of technology enterprises, summarizes the typical risk characteristics and insurance needs of technology enterprises at different stages, reveals the practical shortcomings of current insurance services in product supply, service matching, policy coordination, and proposes improvement ideas from the aspects of institutional design, supply mechanism, and market guidance. At the same time, it also emphasizes the initiative and adaptability of technology enterprises in using insurance tools. It is believed that the healthy operation of the technology insurance service system not only requires the supply side drive of policies and markets, but also relies on the active response of technology enterprises as demanders.

In the future, the development of technology insurance will face more opportunities for practical and theoretical exploration. On the one hand, insurance institutions need to continuously enhance their understanding of the technology industry and accelerate the professional transformation of product design and underwriting methods; On the other hand, policy-making should also focus on the flexibility and guidance of the system, encouraging innovation while preventing systemic risks. Ultimately, by building a dynamic, adaptable, risk controllable, and efficient technology insurance service system through multi-party collaboration, we can better serve the innovation driven strategy and assist in the stable and far-reaching construction of China's modern industrial system.References

References

[1] State Financial Supervision and Administration Bureau. Notice on Strengthening Financial Services for the Entire Life Cycle of Technology-based Enterprises [Z]. 2024.

[2] State Financial Supervision and Administration Bureau. Several Opinions on Strengthening Supervision, Preventing Risks, and Promoting High-Quality Development of the Insurance Industry [Z]. 2024.

[3] Li Zhigang. Vigorously Developing Full Life Cycle Science and Technology Finance [J]. China Finance, 2025, (01):20-21.

[4] Zhang Guangzhi. Strengthening Financial Services for the Entire Life Cycle of Technology-based Enterprises [J]. China Finance, 2024, (08):27-28.

[5] Guo Jinlong, Zhang Ziqi. Solving the Difficulties in the Development of Science and Technology Insurance in my country [J]. China Finance, 2024, (08):29-30.

[6] Shen Yue, Yuan Wei, Cheng Maoyong. The logical framework and key breakthroughs of financial support for high-level scientific and technological self-reliance [J]. Journal of Jishou University (Social Science Edition), 2024, 45(05): 40-51.

[7] Wang Liming, Zhou Yuzhong, Wang Ning, et al. Research on China's science and technology financial support system based on life cycle [J]. Science and Technology Management Research, 2020, 40(10): 36-41.

[8] Du Yue. Accelerating the development of science and technology finance: progress, problems and countermeasures [J]. Economic Review, 2024, (06): 121-128.