

Strategic Optimization of Elevator Insurance in a Risk-Managed Landscape: Insights from China

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Abstract. The escalation in the number of elevators in China is a prominent trend, with projections indicating that over 1.5 million elevators will have been in operation for 15 years or more. This paper explores the expanding ownership of elevators in China and confronts the challenges inherent in traditional control mechanisms. Within this context, this study assesses the feasibility and necessity of elevator insurance in the market application. This evaluation is carried out by conducting a thorough analysis of elevator safety risk factors, the characteristics of risk-related losses, and the advantages that elevator insurance offers in risk management. Additionally, the PEST analysis model is utilized to examine the marketing environment of elevator insurance. Consequently, targeted and differentiated marketing strategies for elevator insurance products are proposed. These strategies encompass market positioning, product development, pricing, and promotional initiatives. The overarching objective is to enhance the adoption and coverage of elevator insurance within the Chinese market.

Keywords: Elevator Insurance; Elevator Risk Management; Elevator Safety; Marketing strategy.

1 Introduction

With China's rapid economic growth and the deepening of urbanization, the elevator industry is experiencing a period of rapid expansion. The number of elevators increased from 1.1754 million units in 2008 to 9.6446 million units in 2022. As the number of elevators continues to rise, so do related safety incidents. In 2022 alone, there were 22 elevator accidents nationwide, resulting in 17 fatalities[1]. These incidents have had a significant impact on the safety of people and their property, bringing elevator safety issues to the forefront of government and societal attention.

Liability insurance, which originated in developed Western countries, has evolved into a comprehensive tool providing a myriad of insurance types and serving both the government and the society at large. In areas like agriculture and environmental protection, liability insurance has been effectively integrated with societal governance[2-3]. To address the challenges brought about by the rapid expansion of the elevator industry - such as increased elevator ownership,

diverse post-sales service demands, insufficient self-regulation among elevator companies, and cutthroat market competition - China's elevator regulatory authorities recognize the positive role of introducing insurance mechanisms. They have accordingly enacted regulations that explicitly encourage the implementation of an elevator liability insurance system.

2 The relationship between elevator safety and insurance

2.1 Analysis of elevator safety risk factors

The safety risks associated with elevators primarily involve factors such as personnel, environment, equipment, and management, and there is a significant positive correlation with their risk exposure[4]. Currently, insurance companies often treat elevator safety risk assessments as a mere formality, lacking collaboration with specialized technical entities and neglecting to closely monitor the prevailing conditions of elevator safety risks. To gain a more comprehensive and insightful understanding of the multifaceted landscape of elevator safety risks and expedite the advancement of elevator safety risk management, this analysis draws upon accumulated professional experience and an extensive review of relevant literature materials. Through meticulous examination, three overarching categories of safety risk factors with the most pronounced impact on elevator safety have been identified. These categories, along with their respective subdivisions, are detailed in Table 1 below:

Table 1. Elevator Safety Risk Factors Analysis.

Risk factor	Category subdivision	
Personnel factor	User	Passengers have weak safety awareness
	Practitioners	Passengers have weak safety awareness
		practitioners lack safety knowledge
	Practitioners	Professional skills of practitioners need to be improved
Equipment factor	Service life	The service life is too long, the aging parts are not replaced in time
	Outdated technology	The elevator configuration function is outdated and fails to meet the current safety requirements
	Use environment	The humidity and temperature of the elevator operating environment are too different from the design
		Excessive frequency of use, resulting in elevator overload
	Management behavior is not standardized	Elevator maintenance is not compliant
Management factor	Management behavior is not standardized	Elevator safety sign missing
		Maintenance personnel lack professional training
	Weak sense of management	Elevators lack special funds for later maintenance
		There is no elevator emergency plan and various management systems
	Inadequate promotion of elevator safety	

2.2 Risk and loss characteristics of elevator insurance

In the context of elevator safety risk management, elevator insurance possesses its own unique characteristics. To more effectively and vividly highlight its inherent advantages, it's beneficial to introduce and compare it with the well-established agricultural liability insurance[5].

2.2.1 Independence of Risk Loss

Agricultural natural disaster insurance experiences non-independence in risk loss due to the high spatial correlation of crop losses caused by disasters. Often, crops within a given area collectively suffer damage due to a disaster. In contrast, elevator insurance confronts safety accidents influenced by factors such as passenger age, riding patterns, elevator operational status, and management methods. These factors operate independently, rendering the random variables of loss stemming from elevator safety accidents independent.

2.2.2 Region of Risk Loss

Agricultural natural disasters vary by region, with disparities between the North and South, such as the prevalence of snow disasters in the North and their rarity in the South. This regional variation results in different disaster exposures for identical crops. However, elevator insurance maintains consistency in risk loss, unaffected by geographic location, whether in Beijing or Sichuan.

2.2.3 Certainty of Risk Loss

In elevator safety accidents or other hazardous occurrences, losses can be precisely quantified in monetary terms when compared to pre-damage conditions or similar cases. Conversely, the losses arising from natural disasters affecting crops are challenging to measure due to the myriad factors and randomness impacting previous years' crop yields.

2.2.4 Payment Ability of the Insured Party

Once elevators are put into operation, property service enterprises typically assume the role of elevator management, holding responsibility for daily safety. Whether the insured party is the elevator user or the maintenance entity, they exhibit a strong payment capability, contributing significantly to marketization efforts. In contrast, agricultural disaster insurance insures a vulnerable group, namely farmers, who often struggle to afford premiums and rely on government subsidies for support. The comparative dimensions of these risk and loss characteristics between agricultural natural disaster insurance and elevator insurance are summarized in table 2.

Table 2. Comparative Characteristics of Elevator Insurance vs. Agricultural Natural Disaster Insurance.

Characteristic dimension	Agricultural natural disaster insurance	Elevator insurance
Risk loss of independence	dependent	independent
Risk loss area	Regional strength	No
Clarity of risk loss	ambiguity	explicit
The ability of the insured person to pay	Need government subsidies	Strong ability to pay

2.3 Advantages of Elevator Insurance for Elevator Risk Management

2.3.1 Innovative Solutions Addressing Societal and Livelihood Issues, Promoting Social Stability

The majority of Chinese communities are currently equipped with elevators, integral to daily life and work routines. Elevators serve as a vital conduit connecting individuals with the outside world. Consequently, elevator safety significantly impacts the well-being and property security of the populace. Given the relatively low probability of major safety incidents involving elevators, many communities forego elevator insurance. Coupled with blurred lines of responsibility regarding elevator usage and a failure to replace aging elevator components, disputes over non-functioning elevators and safety incidents often disrupt social harmony. This situation is detrimental to the establishment of stable social relations. The introduction of elevator insurance products offers long-term lifecycle management, substantially reducing the likelihood of elevator safety accidents. This not only elevates the level of risk management but also fosters stable social relations, thus promoting harmonious development.

2.3.2 Establishing an Integrated Risk Prevention and Control System to Alleviate Regulatory Burden

Elevator safety constitutes a critical societal concern, warranting a broader spectrum of participation in oversight. Insurance companies are intrinsically motivated for robust risk management. Through active involvement in elevator safety management, they enforce quality supervision over maintenance practices, thereby realizing a comprehensive elevator risk reduction strategy encompassing proactive risk prevention, real-time risk mitigation, and post-incident risk compensation[6]. In subsequent service phases, an elevator insurance information management system tailored to the needs of local regulatory bodies and elevator users can be established, facilitating the creation of a diverse risk prevention and control framework with government oversight, insurance firms, users, and maintenance entities at its core.

2.3.3 Elevating Service Quality in the Elevator Industry, Igniting Market Vigor

The introduction of elevator insurance carries positive implications for both user and maintenance units. Users can enhance safety assurance for property owners and elevator equipment by purchasing elevator insurance, while maintenance units can bolster their competitiveness within the maintenance market by opting for elevator insurance coverage. This concerted effort aims to invigorate the market, reduce elevator safety risks, and enable the public to experience elevator insurance services, ultimately raising the service quality standard in the elevator insurance industry.

3 The Marketing Environment of Elevator Insurance in China

The elevator insurance market in China is still in its nascent stages, with a relatively small percentage of elevators currently covered by insurance. Elevators situated in shopping malls, office buildings, and other public spaces have a higher incidence of insurance coverage. In contrast, the development of insurance in residential areas has been slower, influenced by property owners and property management. To invigorate the insurance market, encourage all relevant stakeholders in the elevator industry to actively seek insurance coverage, and broaden

the reach of elevator insurance products, a comprehensive analysis of the marketing environment becomes essential within the context of elevator safety risk management. We employ the PEST analysis model to scrutinize the marketing environment from the perspective of insurance companies, analyzing and studying it across five macro aspects: Legal, Political, Economic, Social, and Technological.

3.1 Legal Environment

The evolution of elevator insurance hinges on the existence of a well-structured legal framework. In the realm of elevator insurance, the national legal system plays a pivotal role in shaping its development. Currently, China lacks clear provisions regarding liability undertakings, liability allocation, and other related aspects concerning damage caused by special equipment. This regulatory gap contributes to the slow adoption of elevator insurance in China. Thus, strengthening and enhancing the existing legal framework is of immense importance and value in promoting the robust growth of the elevator insurance industry.

3.2 Political Environment

In 2018, the General Office of the State Council officially promulgated the "Opinions on Enhancing Elevator Quality and Safety." Within it, there's a clear emphasis on promoting the development of elevator liability insurance, exploring effective protection schemes, ensuring prompt claims services, and resolving conflicts and disputes. It further encourages the innovation of insurance mechanisms, the optimization of the "insurance + service" model, and capitalizes on insurance's capabilities in accident compensation and risk prevention to advance the standards of elevator usage, management, and maintenance. From this, it's evident that introducing insurance mechanisms and focusing on the rigorous management of elevator risks represent the insurance sector's commitment to serving the real economy at its core. This approach is not only essential for the high-quality growth of the insurance industry but is also an objective necessity. The insurance sector, specializing in risk management, boasts a unique advantage in offering long-term, stable risk management and protection. It should play a more prominent role in averting and resolving safety risks, thereby significantly contributing to the harmonious advancement of society[6].

3.3 Economic Environment

China's elevator industry, a cornerstone of the nation's manufacturing sector, has seen a continuous rise in the number of elevators alongside a corresponding increase in elevator-related safety concerns. The integration of insurance mechanisms into this landscape injects fresh vitality into the domestic insurance industry's innovation and development while propelling significant growth within China's elevator market.

From 1990 to 2022, China's urbanization rate surged from 26.4% to 64.72%. Simultaneously, urban construction efforts led to a steady annual increase in elevator production. By 2022, China boasted a staggering 9,644,600 elevators. During this period, China's total GDP soared from 1.89 trillion yuan to 121.02 trillion yuan, with per capita GDP climbing from 17,700 yuan to 85,700 yuan. These seismic economic changes have opened doors of opportunity for both the elevator and insurance industries, positioning them for remarkable growth.

3.4 Social Environment

China finds itself at a pivotal juncture, actively constructing a modern socialist nation following the establishment of a moderately prosperous society. The imperative here is the fundamental development of a modern governance framework, the enhancement of livelihoods, and the evolution of social governance through innovation[7]. Within this societal landscape, the insurance mechanism emerges as an indispensable contributor.

3.4.1 Alarming Safety Accident Landscape

In 2016, the State Council issued the "Opinions on Promoting Reform and Development in the Field of Safe Production," explicitly emphasizing the need to strengthen the safety assurances for urban operations. This included a primary focus on enhancing the inspection and maintenance of urban high-rise buildings, large complexes, tunnels, bridges, pipeline corridors, rail transportation, gas facilities, electrical utilities, elevators, and amusement facilities. Despite the national emphasis on elevator safety, China continues to witness a high frequency of elevator accidents. In 2022, among the reported elevator incidents, there were 2 cases related to safety management issues and insufficient maintenance, 4 cases due to improper operation, 6 cases stemming from the failure of key equipment components or malfunctioning safety devices, and 1 case resulting from inappropriate emergency rescue procedures[1]. The safety of the public's commute is compromised, leading to negative impacts on daily life. In our modern society, where information is readily exchanged and interconnected, such incidents pose a more immediate threat to the harmonious and stable development of the community.

3.4.2 Proliferation of Aging Elevators

In April 2023, during a series of press conferences, Tian Shihong, Deputy Director of the State Administration for Market Regulation, revealed that China boasts 9.8925 million operational elevators, ferrying over 2 billion passengers each day. Among these, a significant 736,800 elevators have been in service for over 15 years. With a yearly addition of new elevators at an approximate growth rate of 10%, it is anticipated that over 1.5 million elevators will reach or surpass the 15-year mark[8]. This evolving landscape ushers in fresh opportunities for the elevator insurance market, showcasing immense market potential.

3.4.3 Shifting Consumer Behavior

Evolving consumer knowledge levels, heightened risk transfer awareness, and shifting insurance preferences have led consumers to opt for simplified insurance solutions. They now favor online products offering convenient claims settlement processes to mitigate potential risks[9]. Examples include overseas travel liability insurance, pet liability insurance, and return insurance, reflecting this change in consumer habits.

3.5 Technical Environment

In an era marked by rapid information technology advancement and the ascent of internet finance, traditional insurance companies grapple with significant challenges to their established business models. To adapt to the changing times, major insurance firms have embarked on a journey of precision marketing and risk management through big data utilization[10]. By leveraging copious customer data from various service delivery channels and developing

advanced predictive analysis models, these companies achieve precise insights into customer consumption behaviors, motivating factors, and more. This, in turn, empowers enterprises to devise tailored marketing strategies and differentiated service approaches, elevating service quality and enhancing customer conversion rates[11].

However, modern technology is not without its limitations, and it may not fully align with the current and future needs of elevator insurance:

(1) Elevators encompass eight complex systems, featuring intricate operational processes and hidden risk points that necessitate on-site risk assessments by specialized technical personnel. Currently, insurance companies often lack collaboration with professional technical entities in evaluating elevator safety risks.

(2) Existing elevator insurance products exhibit several shortcomings, including insufficient coverage and functionality to meet market demands, unadjusted premiums reflecting market dynamics, and limited social trust. The diversity of insurance types remains limited, and coverage remains modest. Insurance companies' insufficient understanding of elevator insurance further impedes its research and development efforts.

4 Optimization of Elevator Insurance Marketing Strategies

4.1 Differentiated Marketing Strategy

Differentiated marketing, often referred to as diversified marketing, is a strategic approach used by enterprises to cater to the diverse needs of segmented market segments. Renowned marketer Jerome McKinsey introduced the 4P marketing combination strategy theory based on market positioning, ushering in a new era of differentiated marketing theory innovation. Differentiated marketing theory revolves around enterprises offering consumers products or services that are distinct from or superior to those of competitors in segmented markets, garnering recognition and attention from consumers while achieving marketing objectives[6]. This strategy hinges on leveraging the diversity and hierarchy of consumer needs, identifying unmet personalized requirements within target consumer groups, and enhancing the functions or marketing measures of existing products to address distinct consumer and personalized needs.

4.2 Selection of Differentiated Marketing Strategy

4.2.1 Market Segmentation

Market segmentation involves selecting specific market segments from within a segmented market. In the context of elevator risk management, elevator insurance can be segmented based on factors such as elevator service life and usage scenarios. For example, elevators in high-traffic areas like shopping malls and subways may differ in service life, usage frequency, and equipment management, warranting specialized insurance products.

4.2.2 Market Positioning Differentiation

Market positioning entails determining where products or services stand within the target market during the marketing process. It involves defining the competitive stance of products or services in the target market. By selecting the target market, an insurance company can position its

elevator insurance products favorably in the minds of consumers, significantly influencing their purchasing decisions. For example, an insurance company could focus on promoting the concept of "instant compensation in the event of entrapment." This differentiation in positioning provides a robust assurance for consumers' travel safety and can help the insurance company secure a prominent foothold in the elevator insurance market.

4.2.3 Product Strategy Differentiation

Product differentiation centers on producing products that offer superior quality and performance compared to similar products from other manufacturers, thereby creating an independent market. Elevator insurance product strategy differentiation can be primarily approached from two angles: product function differentiation and service differentiation.

Product function differentiation pertains to the unique benefits a product offers in meeting consumer needs. For instance, elevator insurance can differentiate itself by offering features like immediate compensation for entrapment or prompt payment for aging parts replacement, catering to consumers' personalized requirements. Product function differentiation can vary degrees of market share through these distinct product features. Therefore, enterprises should concentrate on understanding buyers' desires and interests to better fulfill their needs.

Product and service differentiation focuses on providing superior quality services compared to competitors for the target market. Particularly when it's challenging to highlight differences in tangible products, competitive success often hinges on the quantity and quality of services. Insurance companies can innovate elevator safety risk assessment methods and collaborate with professional technical institutions to provide expert assessments of elevator safety risks. For example, adopting an "insurance + testing" model, insurance companies could offer complimentary elevator safety testing by professional institutions after consumers purchase their insurance products. These innovative services distinguish these companies from competitors in the industry, forming strong brand identity and value distinctions in the minds of consumers.

4.2.4 Pricing Strategy Differentiation

Pricing strategies can introduce differentiation by varying prices compared to similar products, either higher or lower. The choice of a pricing strategy primarily hinges on the enterprise's development strategy. Additionally, product pricing should take into consideration market positioning, product life cycle, and the overall capabilities of the enterprise, among other factors. For instance, products offering "entrapment and compensation" benefits, barring external influences, tend to have low probabilities of widespread stoppages and entrapments due to factors such as passenger behavior, equipment quality, and management practices within the same community. Insurance companies can strategically price their products based on consumers' perceived value, gradually consolidating their industry leadership position by leveraging their cost competitiveness.

4.2.5 Promotion Strategy Differentiation

Promotion differentiation involves altering product promotion methods, seizing appropriate timing, and employing strategies that align with distinct product characteristics. By differentiating promotional activities from those of competitors in the same industry, enterprises

can maximize the impact of their promotions. Tailoring promotion methods to product characteristics can yield more efficient results. For instance, during the national "Safe Production Month" campaign, insurance companies can collaborate with professional technical institutions to engage elevator industry professionals in explaining the technical intricacies of elevator safety risks and insurance products. This approach can help dispel consumer doubts and misunderstandings, ultimately boosting product sales.

5 Conclusion

This study, set against the backdrop of China's continuously rising elevator inventory and the challenges posed by traditional regulatory measures, delves into the safety risk factors of elevators, the characteristic loss attributes of elevator insurance, and its advantages in the realm of risk management. It underscores the practicality and necessity of elevator insurance in market applications.

Taking into account the distinctive features of elevator risks and their loss characteristics, the PEST analysis model is employed to assess the marketing environment for elevator insurance. Recommendations are made for differentiated marketing strategies for elevator insurance products, focusing on market positioning, product development, pricing, and promotion, aiming to further expand elevator insurance coverage. Such measures not only contribute to safeguarding the life and property of the public but also promote the healthy growth of China's elevator industry. This fosters the construction of a diversified co-governance risk prevention system, achieving a win-win situation of stable social harmony and ensuring the safety of the people's lives and property.

Acknowledgments. Sichuan Provincial Market Supervision and Administration Bureau Science and Technology Plan Project: A Study on Elevator Liability Insurance System from the Perspective of Collaborative Governance (Grant No. SCSJZ2022008).

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