A Study on the Design of a Performance Bond for After-school Tutoring Institutions' Prepaid Consumption

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Abstract

Against the backdrop of increasing consumer complaints about out-of-school education and training and the difficulty of refunding fees caused by the closure of training institutions, this paper analyses the development of China's education and training industry in the last decade and the risks it is currently facing, and designs an innovative after-school tutoring pre-paid consumption perfomance bond insurance based on 218 questionnaires collected. The product uses a big data platform to connect three different ports of the APP, drawing on the new model of “commercial insurance and e-CNY and platform supervision”. It uses credit rating to determine the cost, a credit level transfer matrix to calculate the probability of risk events and the average cumulative default rate to achieve reasonable pricing over a long period of time, and nearly a dozen calculation formulas to determine the balance of the advance receipts, which provides consumers with more comprehensive and flexible risk protection. At the same time, we have studied the user experience optimisation and marketing strategy of this insurance product, aiming to achieve a virtuous cycle for the insurance company. As an innovative insurance product, the product fills a gap in the market and is highly competitive in terms of future market demand. We hope that insurance can effectively protect the legitimate rights and we expect to provide realistic help for those of us who aspire to education and provide reference for other consumer protection.

Keywords: After-school Tutoring, Performance Bond, Prepaid Consumption

Competing Interests:

The authors declare that there is no conflict of interest.

1. Introduction

In recent years, China's after-school tutoring industry has grown rapidly, supplementing school education by meeting adolescents' diverse needs. However, issues like institutions absconding with money and refund difficulties harm consumers. Prepaid consumption, common in tutoring institutions for cash flow, amplifies risks due to long cycles and large amounts. If an institution shuts down, consumers face losses and tough rights protection.

To address this, a performance bond for prepaid consumption in after-school tutoring institutions is designed. This paper covers policy background, market analysis, product design, and marketing strategies to offer a solution for regulating the industry and protecting funds.

China's after-school tutoring industry has over 4 million institutions, with English, IT, and K12 education as pillars, growing 20% annually. But since the 2021 "Double Reduction" policy and COVID-19, many closed. Complaints about tutoring services rose from 20,521 in 2018 to 80,528 in 2021, accounting for 7.71% of total and 15.57% of service-related complaints. Incidents like Chengdu's "Aibeisi" and Shanxi's "WuxianXingkong" make refunds a parent worry.

Existing regulations like the national tutoring supervision platform and third-party custody improve fund safety but limit institutions' capital flexibility. For example, Wenzhou's "smart tutoring supervision cloud platform" and Wuxi Huishan's prepaid fund platform use full supervision, hindering operations. Thus, a balance between safety and flexibility is needed.

We study the performance bond, covering policy background, market risks, product defects, consumer demand via surveys, product design (framework, liability, premium, claims), and marketing strategies**.**

Our study has three contributions: filling the gap in specialized insurance for tutoring prepaid consumption, integrating credit rating into premium setting for better pricing, and proposing a "commercial insurance + e-CNY + platform supervision" model balancing safety and flexibility.

The paper is structured as: Section 2 on policy background and research; Section 3 on market risks, products, and survey results; Section 4 on product design; Section 5 on advantages and challenges; Section 6 on policy recommendations.

2. Policy Background and Previous Research

2.1 Policy background

The Chinese government has gradually strengthened supervision over the after-school tutoring industry and prepaid consumption in recent years, providing a policy basis for the design of this performance bond.

In terms of the after-school tutoring industry, the "Opinions on Further Reducing the

Burden of Homework and After-School Tutoring for Compulsory Education Students" (the "Double Reduction" policy) issued in 2021 clarified the supervision of off-campus training institutions, requiring strict approval of non-academic institutions and prohibiting academic institutions from listing for financing . In 2022, the "Outline for Expanding Domestic Demand (2022-2035)" proposed to standardize after-school tutoring and improve consumer rights protection mechanisms. The establishment of the Off-Campus Education and Training Supervision Department by the Ministry of Education in 2021 further demonstrated the state's emphasis on industry regulation.

For prepaid consumption, the "Consumer Rights Protection Law" and the "Measures for Punishing Acts Infringing on Consumer Rights and Interests" stipulate that operators must provide services as agreed or refund prepaid funds, but lack specific implementation rules . The "Interim Measures for the Financial Management of Off-Campus Training Institutions" issued in 2023 requires tutoring institutions to deposit prepaid fees into special accounts and implement full supervision through bank custody or risk guarantees, but this has led to capital rigidity for institutions.

2.2 Previous research

The domestic education and training industry began to develop in 1980 when the State Council promoted education reform, and now enjoys the dividends of the era for several decades.

In July 2021, the General Office of the Central Committee of the Communist Party of China (CPC) and the General Office of the State Council (GOH of the State Council) jointly issued the 'Double Reduction' policy, which stressed the need to comprehensively regulate off-campus subject education at the stage of basic education (Zhongyin Zhang, 2023). The policy of double reduction According to a research report by Deloitte, one of the world's top four accounting firms, the size of China's education market is expected to expand to RMB 2.9 trillion by 2020, and the size of the private education industry is expected to maintain a compound annual growth rate of more than 15 per cent over the next few years, so China's private education industry is stepping into a "golden age" (Yanhong Chen, 2020). Experts believe that due to the nature of their training subjects, there may be some blind spots in the supervision of non-disciplinary after-class tutoring institutions, and that the accountability mechanism for those in charge of the absconding institutions should be improved. (Rule of Law Daily, 2021).

China has actively formulated relevant local pilot policies, such as the 'Rules for Supervision of Funds Received in Advance from Single-Purpose Prepaid Cards of Beijing Municipal Professional and Technical Vocational Qualification Examination Training Institutions (Trial)' (hereinafter referred to as the 'Supervision Rules'). The Regulation specifies seven aspects of training services, such as charging principles, signing of training

service contracts, establishment of a mechanism for sales visits, provision of enquiry on the use of training fees, time limit for refunds, filing of training institutions and bank depository of prepaid consumer funds, etc., which improves the mechanism of accountability for the persons in charge of the institutions that have run away, and protects the legitimate rights and interests of consumers to a certain extent. To a certain extent, to protect the legitimate rights and interests of consumers, regulate the market order and prevent social risks.

Some foreign countries, such as Japan and the U.S., do a better job of protecting prepaid consumption, and they have their own reasonable legal provisions to protect prepaid consumption (Xu Liting, 2014). And due to the prevalence of consumerism, most of the research on the field of prepaid consumption in China is limited to the field of marketing, but it is not enough to be limited to the study of marketing, which not only has an important impact on the positive operation of the market economy, but also has an important impact and role in the daily life of the majority of consumers (Wang Jia, 2022).

Based on the analysis of the literature, it can be concluded that, firstly, there are a large number of after-class tutoring institutions, most of which are small and medium-sized institutions, with the head institutions accounting for only 10 per cent of the market share. This "large and scattered" phenomenon makes the operation of small and medium-sized after-class tutoring institutions deeply affected by the market environment and vulnerable to policy changes, natural disasters and other events. Secondly, the protection of prepaid consumption is more standardised in foreign countries, focusing on appropriate measures in terms of government legislation, industry supervision and information disclosure, whereas in China, appropriate measures are still in place.

Third, the current direction of prepaid consumption protection is still mainly in the field of marketing, and there is a lack of research on the education industry, which is a key area for cultivating the next generation; fourth, how to combine prepaid guarantee insurance with the prepaid consumption of education institutions to alleviate the impact of the unpredictability of the education institutions' unpredictability. Fourthly, how to combine prepaid guarantee insurance with prepaid consumption of education institutions to reduce the problem of large consumer losses and difficulty in defending rights brought about by the closure of education institutions without any signs has gradually become a social pain point and a focus of scholars' research, and it has become the primary issue for the education industry to recharge the energy for the development of the education cause under the background of the policy of ‘double-reduction’. In summary, based on the literature analysis, it can be concluded that the education and training industry is difficult to defend the rights of consumers, difficult to refund fees and other issues, small and medium-sized training institutions are vulnerable to the impact of the market environment, the security of prepayment of consumers to the training institutions there are unstable factors, and the lack of corresponding tools to reduce the risk.

Throughout the current situation of education and training industry, prepaid guarantee insurance and the operation mode of prepaid consumption in China and foreign countries, prepaid consumption is still in the nascent stage in China, and its application is concentrated in the field of marketing, while there is a lack of strong protection means for the ever-hot prepaid behavior of education. This paper will start from the undesirable business behavior of after-class tutoring institutions closing down without warning, and explore the depth of combination and synergy of regulating education and training industry norms, prepaid consumption and insurance protection.

3.Market Analysis

3.1 Market status and risk analysis

3.1.1 Situation of after-class tutoring institutions

The number of after-class tutoring institutions is large, and the potential risk of default is high. A total of 490,000 after-tutoring institutions exist nationwide. Since the introduction of the "Double Reduction" policy in 2021, many primary and secondary after-class tutoring institutions have transformed and withdrawn from the market, and the number of education and training enterprises has declined, while at the same time, special after-class tutoring institutions have risen, with a significant increase in the number of registrations. At present, the large volume of after-class tutoring institutions in the market, the potential risk of default, and after-class tutoring institutions for a large number of consumers, a wide range of audience groups, the number of potential customers, for after-class tutoring institutions prepaid consumer performance bonds provides a great demand.

3.1.2 The default risk of after-class tutoring institutions exists objectively

The counter-cyclical nature of operation increases the risk of prepaid consumption. As a kind of commercial credit, the basic scale of the consumption mode of prepayment is closely related to the change of economic cycle, and the more in the period of economic downturn, the operators are more motivated to expand the scale of prepayment consumption, which manifests itself as a strong counter-cyclical feature. Since 2020, in the case of operating difficulties in many living service industries, prepayment has been an important support for the cash flow of the operators during the New Crown Pneumonia Epidemic. However, increased business difficulties during the economic downturn, coupled with changes in the industry environment and corresponding policies, have made it easier for operational and payment risks to arise and potential default rates to increase, resulting in a market gap for prepaid consumer performance bonds for education providers, which provides market feasibility for the implementation of insurance.

3.1.3 Consumers' instrumental dependence on risk control

Consumers' instrumental dependence on contractually based interconnected commercial

credit needs to be facilitated by the arrangement of a number of specific mechanisms, which consumers currently lack. On the one hand, there is a lack of information channels for consumers, insufficient capacity and resources for obtaining credit information through their own investigations or commissioned investigations, and the mechanism for obtaining credit information through public channels such as the news media, government departments and relevant organizations is not yet sound. On the other hand, consumers have insufficient ability to identify commercial credit risks and limited means to manage them. Consumers mainly impose market constraints on operators, such as speeding up consumption to reduce the outstanding amount and the risk it brings, and in the face of risk exposure, they mainly resolve the issue through complaints or self-digestion; judicial rights defence is less frequently used due to higher costs, and there is a lack of appropriate tools to effectively control risks.

3.2 Competitive advantages and analyses of similar products

3.2.1 Competitive advantages

As an innovative type of insurance, prepaid consumer performance bonds for teaching and training institutions fills the vacancy in the market and is extremely competitive, which is conducive to discovering new market opportunities and opening up new insurance market areas. Increase market share, gain market share growth and improve the profitability of insurance companies.

"By seamlessly connecting with the core business systems of insurance companies, banks and third-party payment, microfinance, consumer finance, guarantee, financial leasing and other financial institutions, the HPS system has built a solid technical foundation for prepaid consumer performance bonds for education institutions, which is conducive to the convenience, digitisation and information of the services of the insurance products, improving economic efficiency and increasing economic returns, and making the educational institutions prepaid consumer performance bonds higher market share.

3.2.2 Analysis of similar products

Shenzhen Municipal Consumer Council and the Shenzhen Education and Training Industry Association for the education and training industry prepaid consumption plus insurance, the introduction of the "Ke Cheng Bao" and the Bank of China as a co-operative party, the training institutions in the "KeChengBao" shelves course, the consumer in the "KeChengBao" on the purchase of the course can apply for prepaid supervision services, after the application is successful, the consumer prepaid into the Bank of China supervised account, when the consumer confirms the class, the consumer can apply for prepaid supervision service, after the application is successful. After successful application, the prepayment paid by the consumer will be transferred to the account supervised by the Bank of China, and only

when the consumer confirms the course will the course fee be transferred to the account of the institution. This project can effectively avoid them running away due to poor operation of the institutions and damage to consumers' rights and interests, but the transfer of fees to a third-party account greatly restricts the institutions' flexible access to cash flow and increases the possibility of closure of the institutions, based on which the team has adopted the new model of 'Commercial Insurance + E-CNY + Platform Supervision'. Based on this, our team adopts the new model of 'commercial insurance + e-CNY + platform supervision', which realises credible prepaid consumption vouchers for after-class tutoring institutions through the Teaching Prepaid Star big data platform, dynamically supervises 30% of the prepaid funds relying on e-CNY, and combines with the insurance guarantee to cover the safety of a total of 70% of the prepaid funds.

3.3 Questionnaire survey

3.3.1 Consumer attitudes

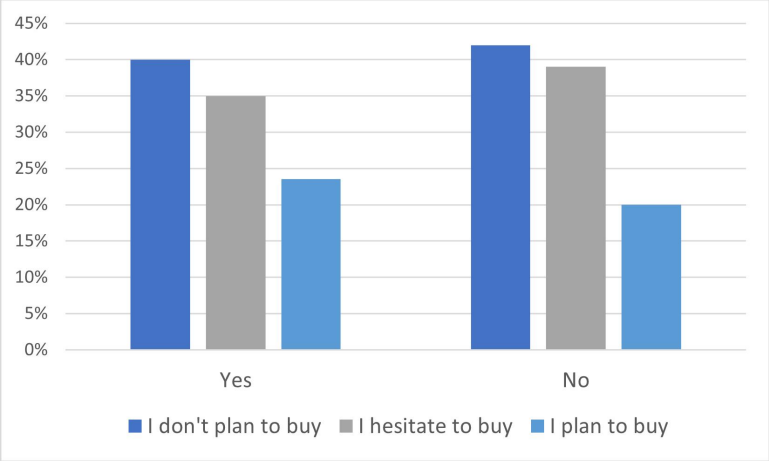

Figure 1 Economic loss experience and willingness to purchase performance bonds

A total of 218 people participated in the survey. As shown in the figure, 51 (23.29%) have experienced merchants absconding with money, while 165 (75.69%) haven't. This suggests that the risk of such incidents in prepaid consumption at educational institutions may reach a quarter, underscoring the need for performance bond insurance in the sector.

Of those who encountered such incidents, 12 (23.53%) intend to purchase the insurance – a slightly higher proportion than those who didn't. This indicates that people are more willing to buy insurance to protect prepaid funds after experiencing merchant absconding. Thus, when promoting the product, insurers should emphasize that it reduces property loss risks from merchant absconding through asset supervision and provides timely compensation when problems occur.

Nearly 60% of the 218 respondents are willing or intend to purchase the insurance, showing significant development potential for the product. Insurers should keep innovating and upgrading it – applying big data algorithms and actuarial technology to product

development, risk control, and asset supervision – to meet diverse asset protection needs, expand influence, and convert more potential customers.

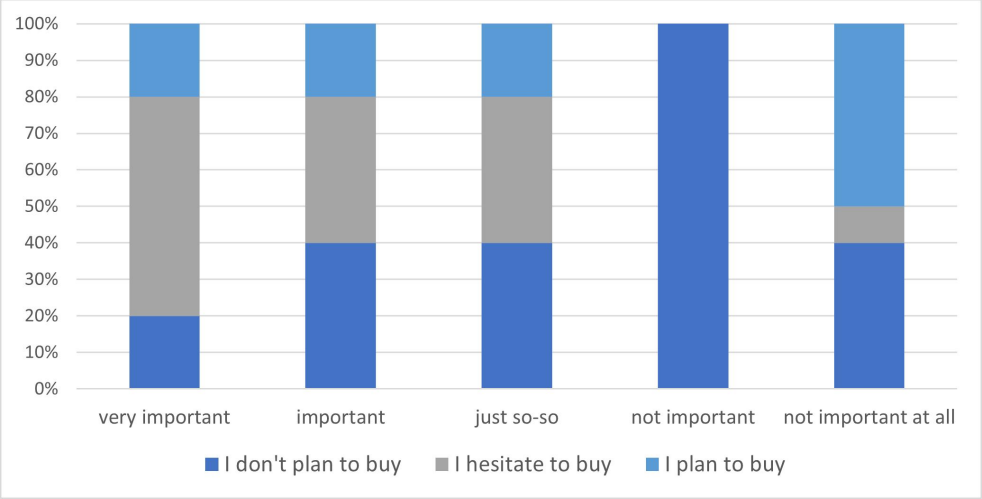

Figure 2 Attitudes to after-school tutoring and willingness of consumers to purchase performance bonds

As shown in the figure, among the 218 respondents, less than 6% think after-school tutoring is unimportant. Among the remaining 94%, about 20% are willing to purchase the performance bond insurance. Notably, nearly 75% of those who consider after-school tutoring very important are willing or intend to buy it. This indicates that the performance bond insurance has a large audience and great market potential, requiring insurance companies to continuously enhance product competitiveness, diversify products horizontally and vertically, and firmly retain these customers. However, among the 70% who think after-school tutoring is important or average, nearly 40% are hesitant about purchasing the insurance. This suggests that while insurance companies innovate and upgrade products, the government should also strengthen supervision to promote the stable and orderly development of performance bond insurance. Effective government supervision can also enhance the credibility of the insurance, encouraging hesitant people to try purchasing it.

3.3.2 Consumer spending intentions

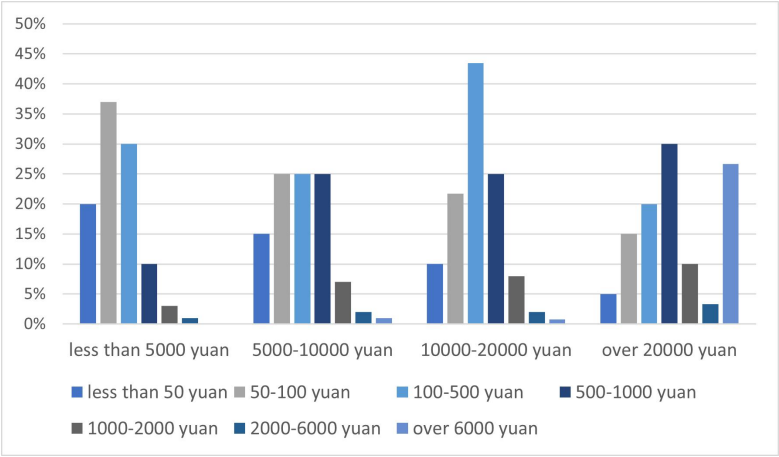

Figure 3 Funds invested in education and willingness to pay premiums

As shown in the figure, when the annual educational expenditure of a family is below 5,000 yuan, 36.96% of families can accept a performance bond insurance premium of 50-100 yuan. When the annual educational expenditure is between 10,000-20,000 yuan, 21.74% of families can accept a premium of 50-100 yuan, while 43.48% can accept a premium of 100-500 yuan. When the annual educational expenditure exceeds 20,000 yuan, 26.67% of families can accept a premium of more than 6,000 yuan.

With the continuous increase in families' annual educational expenditure, families with higher educational expenditure are more worried about the risk of educational institutions absconding with money and have a greater demand for performance bond insurance. Therefore, they are more willing to choose performance bond insurance with higher premiums to transfer the risk of educational institutions and reduce family losses. In today's rapidly developing society, more and more families are increasing their investment in education year by year, and the corresponding demand for performance bond insurance is also increasing year by year. Therefore, performance bond insurance is more likely to develop in contemporary society.

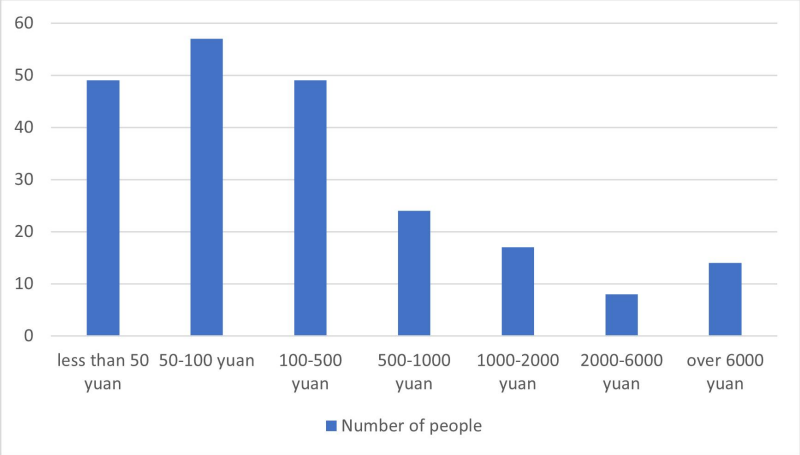

Figure 4 The amount of annual insurance premium that can be accepted

As shown in the figure, among the 218 respondents, 57 people, accounting for 26.15%, are willing to pay 50-100 yuan for the prepaid guarantee insurance for education and training. More than 60% of the respondents are willing to pay less than 500 yuan for it, while only 6.42% are willing to pay more than 6,000 yuan. These data show that in the current prepaid guarantee insurance market, most consumers are reluctant to spend more on prepaid guarantee insurance. Therefore, the insurance should actively adapt to the current prepaid insurance market in terms of premium pricing to promote better promotion.

3.3.3 Consumer awareness

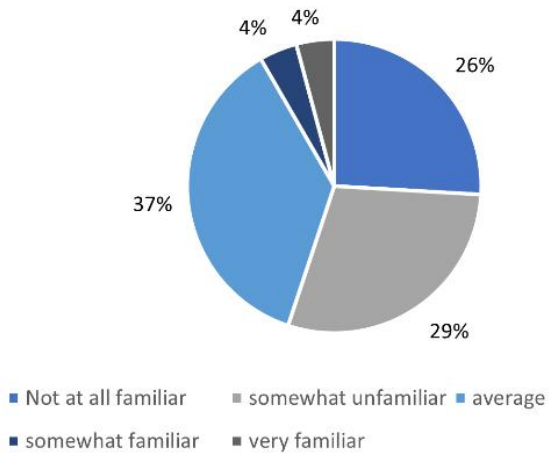

Figure 5 Level of understanding of prepaid consumer protection

Only 18 people, accounting for 8.26%, have an understanding of prepaid consumption protection. Over 90% know nothing about it. This indicates that prepaid consumption protection still has a small audience in daily life. Many people have never learned about protection methods and even don't know that prepaid consumption can be protected. To some extent, this reflects people's weak awareness of safeguarding prepaid funds. Although this will bring certain obstacles to the promotion of such insurance, it also proves that prepaid consumption protection methods, such as commercial insurance for prepaid protection, have huge development potential.

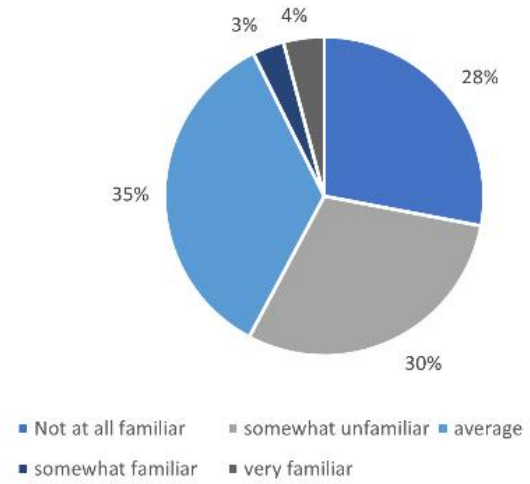

Figure 6 Level of knowledge of prepaid protection commercial insurance

As shown in the figure, only 16 people, accounting for 7.33%, have an understanding of commercial insurance for prepaid protection, while over 90% know nothing about it. Given the small number of people who know about it, three measures can be taken. First, publicity strategies can be adopted. Second, more subjects can be encouraged to participate. For example, insurance premiums can be shared by merchants and customers. For merchants, this can enhance customers' trust, extend the payment cycle, help them raise funds and lock in customer sources. For customers, it can reduce premiums, allowing them to secure more

funds with less premium, while enjoying discounts from prepaid consumption and the convenience of reduced cash use and easier payment. Third, insurance companies can negotiate with merchant representatives, offering preferential policies to encourage merchants to link their product sales with prepaid guarantee insurance. This will help more customers learn about commercial insurance for prepaid protection and increase its popularity.

4. Insurance Design Practice

4.1 Design framework and philosophy

This product actively responds to the call of the Ministry of Commerce and targets the social hotspot of successive cases where after-class tutoring institutions abscond with funds. Taking the difficulty in protecting consumers' rights and interests as the breakthrough point, and based on the National Off-Campus Education and Training Supervision and Service Comprehensive Platform, insurance companies have built a big data platform for after-class tutoring institutions' performance bond insurance and launched three apps for parents, after-class tutoring institutions and insurance companies, realizing "one network and three terminals". Consumers can apply for insurance through the parent-side app, which makes the insurance application process more convenient.

The product draws on the new model of "commercial insurance + e-CNY + platform supervision". 30% of the prepaid funds are converted into e-CNY for dynamic supervision. It also combines technical means such as OCR and intelligent customer service to reshape the insurance claim settlement process and improve the processing efficiency of the claim application stage. It compensates consumers for losses caused by the unannounced closure of after-class tutoring institutions and is expected to provide innovative ideas for prepaid consumption performance insurance in other industries.

4.2 Design of insurance liability

4.2.1 Insurer and insured

Insurer: The insurer of this insurance product shall be an underwriting insurance company. The insurance company is required to have operational and claim-paying capabilities, as well as rich operational experience in prepaid consumption mechanisms. It shall enter into an insurance contract with the applicant and assume the liability for indemnity or payment of insurance benefits.

Insured: Consumers who have paid a deposit to the insured after-class tutoring institution or its affiliated units and suffered losses due to failure to enjoy services in accordance with the contract caused by the institution's unannounced closure, as well as those who meet the principle of insurable interest and have the right to claim insurance benefits.

4.2.2 Insurance period

The insurance period of this insurance can be flexibly adjusted according to the

applicant's course purchase contract. Losses of prepaid funds caused by the unannounced closure of after-class tutoring institutions within the insurance period can be compensated in accordance with the compensation rate within the scope of protection specified in the insurance liability.

4.2.3 Coverage

This product is designed for consumers who suffer losses due to the unannounced closure of after-class tutoring institutions. The prepaid consumption performance guarantee refers to providing compensation for consumers who suffer losses due to interrupted performance caused by unannounced closure, aiming at the default problems arising from the prevalence of prepaid consumption in the after-class tutoring industry.

When the insured who has purchased this product is affected by the unannounced closure of an after-class tutoring institution that provides prepaid services, they can declare to the insurer to start the claim settlement process with prepaid consumption vouchers and the institution's operation status description. After verification and confirmation, the insurer will provide compensate for losses in accordance with the provisions of the insurance contract.

4.3 Rating and indemnity

4.3.1 Calculation of net rates

Based on the expected loss pricing principle, this study determines the net premium rate of the prepaid consumption performance bond for after-class tutoring institutions by considering the credit rating of after-class tutoring institutions, the probability of their rating changes, the average cumulative default rate, and the balance of consumers' prepaid funds.

(1) Credit rating, reflecting the ability of the after-school tutoring institution to perform during the insurance period

To address issues such as information asymmetry between after-class tutoring institutions and consumers, as well as moral hazards, this product innovatively uses credit ratings in its pricing. It accurately reflects the level of an enterprise's performance risk in premiums, thereby fully realizing the principle of vertical fairness. This insurance product analyzes five key elements of after-class tutoring institutions to determine their actual credit ratings for the current year. The specific rating details are as follows:

Elements of credit rating

Table 1

Rating elements	impact results
Environment	External conditions affecting the credit status of educational training institutions, including legal environment, market environment, policy environment, economic environment, etc.
Basis	Internal conditions affecting the credit status of educational training institutions, including corporate quality, scale strength,

Rating elements	impact results
	management mechanism and other credit evaluation contents.
Capacity	Credit evaluation contents such as the operating ability, growth ability and development prospects of educational training institutions, which reflect the driving force of corporate credit.
Performance	Including the solvency and performance of educational training institutions, so as to reflect the credit status of enterprises.
Guarantee	Economic benefits or profitability of educational training institutions.

Based on the above elements, after-class tutoring institutions can be classified into eight grades: AAA, AA, A, BBB, BB, B, CCC, and Default.

(2) Credit Rating Transition Matrix, Determinng the credit rating of an after-class tutoring institution with a known credit rating after n years

Since the credit rating of an enterprise changes dynamically, the insurer cannot predict the actual credit rating of the after-class tutoring institution in several years. To fully calculate the probability of the after-class tutoring institution changing to different credit ratings in different periods, this product uses a credit rating transition matrix to solve this problem. The following is the enterprise credit rating transition matrix after one year:

Credit rating transfer matrix after one year (%)

Table 2

Credit level	AAA	AA	A	BBB	BB	B	CCC	Defend rules
AAA	90.81	8.33	0.68	0.06	0.12	0	0	0
AA	0.7	90.65	7.79	0.64	0.06	0.14	0.02	0
A	0.09	2.27	91.05	5.52	0.74	0.26	0.01	0.06
BBB	0.02	0.33	5.95	86.93	5.3	1.17	0.12	0.18
BB	0.03	0.14	0.67	7.73	80.53	8.84	1.00	1.06
B	0	0.11	0.24	0.43	6.48	83.64	4.07	5.21
CCC	0.22	0	0.21	1.3	2.38	11.24	64.86	19.79

(Note: The vertical ratings represent the initial credit ratings of after-class tutoring institutions, and the horizontal ratings represent their credit ratings one year later.) According to the literature by Michel Crouhy, Dan Galai, and Robert Mark (2000), credit transition matrices conform to the standard Markov process. Using the calculated credit rating transition matrix of after-class tutoring institutions one year later as initial data, the transition matrix after n years can be computed with Matlab software. The following is the rating transition matrix after two years, and transition matrices for other periods will not be listed one by one.

Credit rating transfer matrix after two years (%)

Table 3

Credit level	AAA	AA	A	BBB	BB	B	CCC	Defend rules
AAA	82.55	15.13	1.89	0.21	0.22	0.02	0	0
AA	1.28	82.41	14.20	1.57	0.20	0.28	0.04	0.02
A	0.18	4.15	83.41	9.90	1.58	0.59	0.04	0.15
BBB	0.05	0.73	10.65	76.32	9.00	2.49	0.28	0.48
BB	0.06	0.29	1.64	13.03	65.86	14.70	1.82	2.59
B	0.01	0.21	0.50	1.30	10.75	70.69	6.10	10.43
CCC	0.34	0.04	0.45	2.22	4.26	16.90	42.55	33.24

The probability of a change in the credit rating of an after-class tutoring institution with a credit rating of i after n years is calculated through tools such as the credit rating transition matrix, that is, to determine the corresponding value of p_i.

(3) Average Cumulative Default Rate, Determining the default rate for the credit rating the after-school tutoring institution is in after N years

Here, the default rate refers to actual defaults where after-class tutoring institutions fail to fulfill contractual obligations, causing consumers economic losses. Rating agencies usually calculate it by tracking past ratings, counting defaults of each level, and comparing default numbers (or amounts) with the total of that level to get the default rate for the credit rating. They then build and update a default rate database. The average cumulative default rate is calculated from the average marginal default rate.

Institutions with good credit ratings have low default probabilities; those with ratings below BBB see a sharp rise in default risks. In practice, the team only calculates premiums for institutions rated higher than CC. The probability of insured amount loss for institutions in different periods and under different credit ratings is determined via the average cumulative default rate to confirm the corresponding value of p.

Average cumulative default rate (%)

Table 4

Period credit level	1year	2year	3year	4year	5year	6year	7year	N year
AAA	0.00	0.00	0.07	0.15	0.24	0.38	0.66	……
AA	0.00	0.02	0.12	0.25	0.43	0.56	0.89	……

A	0.06	0.16	0.27	0.44	0.67	0.89	1.11	……
BBB	0.18	0.44	0.72	1.27	1.78	2.22	2.99	……
BB	1.06	3.48	6.72	8.68	10.97	12.06	14.46	……
B	5.20	11.00	15.95	19.40	21.88	23.42	25.14	……
CCC	19.79	26.92	31.63	35.97	40.15	41.00	42.64	……

Due to changes in credit ratings of enterprises with different credit levels over different periods, their corresponding average cumulative loss rates also vary. The premium calculation formula for applicants who prepay for annual courses is as follows:

$$Pure\ premium = The\ single\ period\ amount \times E(p_i \times p_i \times \lambda V) \quad (1)$$

To visually represent the impact of credit ratings on pure rates, the table below summaries the pure rates corresponding to different credit ratings of after-school tutoring providers over a four-year period:

Net rates for different credit ratings

Table 5

	First year	Second year	Third year	Fourth year
AAA	0.00425	0.042	0.29775	0.6995
AA	0.04425	0.263	0.77125	1.534
A	0.28625	0.9885	2.08375	3.6725
BBB	0.955	3.23425	6.4865	10.60975
BB	5.007	14.87625	25.363	35.2245
B	18.93775	39.6125	57.51325	71.64675
CCC	55.943	81.85575	101.725	118.38

4.3.2 Calculation of sum insured

Sum Insured is determined by the applicant and the insurer based on the estimated maximum balance of prepaid funds of the applicant during the policy period multiplied by the underwriting ratio, with the underwriting ratio set at 100%. It is expressed by the formula:

Sum insured = (Funds prepaid by consumers to after-class tutoring institutions - Estimated consumption amount during the policy period) × *Percentage of cover* (2)

Prepaid Funds: Refer to the total amount of funds prepaid by consumers to after-class tutoring institutions.

Prepaid Fund Balance: Refers to the balance of consumers' prepaid funds after deducting the price of already redeemed tutoring services.

At the time of insurance application, the insurer calculates the prepaid insurance premium according to the following formula:

Prepaid insurance premium = Sum insured × *Net insurance rate* (3)

After the expiration of the policy period, the insurer calculates the actual insurance premium according to the following formula:

Actual insurance premium = Actual maximum prepaid fund balance during the policy

$$period \times Percentage\ of\ cover \times Net\ insurance\ rate \quad (4)$$

If the actual insurance premium is higher than the prepaid insurance premium, the applicant shall make up the difference; if the prepaid insurance premium is higher than the actual insurance premium, the insurer shall refund the difference to the applicant.

4.3.3 Loss indemnity methods

As this is an unvalued insurance product, the sum insured agreed upon by the parties is determined by the consumer's expected consumption amount, given the prepaid funds and underwriting ratio (100%). When an insured event occurs, the actual loss may differ from the sum insured. This product provides three solutions for indemnity calculation:

Under-insurance: When the sum insured is lower than the product of the actual maximum prepaid fund balance at policy expiration and the underwriting ratio, the indemnity for each insured is calculated as:

$$Indemnity = Remaining\ prepaid\ funds\ for\ unconsumed\ services \times (\ Expiration\ expected\ maximum\ prepaid\ balance\ at\ policy\ expiration\ /\ Actual\ maximum\ prepaid\ balance\ at\ policy) \times Percentage\ of\ cover \quad (5)$$

Full-insurance: When the sum insured equals the product of the actual maximum prepaid fund balance at policy expiration and the underwriting ratio, the insurer shall indemnify the full amount of the loss.

Over-insurance: When the sum insured is higher than the product of the actual maximum prepaid fund balance at policy expiration and the underwriting ratio, the indemnity for each insured is calculated as:

$$Indemnity = Actual\ maximum\ prepaid\ balance\ at\ policy\ expiration \times Percentage\ of\ cover \quad (6)$$

Insurer shall refund the premium corresponding to the excess sum insured.

4.4 Marketing Strategy

4.4.1 online marketing

Push value-added services to consumers via LBS: The insurance platform uses LBS to push other value-added services in the after-class tutoring industry (such as children's enlightenment, music, sports and art teaching resources) to consumers through their app, making it easier for them to choose more suitable after-class tutoring institutions and greatly reducing the effort spent on offline searches and consultations.

Emotional marketing through online media: Launch special columns on after-class tutoring institutions' prepaid consumption performance bond insurance or use news and information columns with high viewership to timely report the latest developments in the insurance market, and explain typical cases, so that all sectors of society can realize the importance of such insurance.

Ad placement in O2O mode: Users interact frequently with ads on smart terminals. Most current "mobile" ads only appear in mobile web searches and display ads without leveraging the features of mobile smart terminals. Ads should take advantage of terminals' convenience and portability to become a platform for showcasing insurance companies' brand images.

4.4.2 offline marketing

To boost the insurance's visibility, insurance companies can collaborate with after-class tutoring institutions for offline promotions in places like universities and shopping malls. They can also organize special lectures, seminars, and product experience sessions to attract target customers, help them learn about the product, and further partner with relevant industry players to host joint promotions or cooperative marketing activities—sharing resources and customer bases, and selecting appropriate promotion methods based on specific services and target customer groups.

Coupons can be used for marketing: After consumers purchase this insurance, the platform will issue electronic consumption coupons to their accounts, which can be used for daily shopping or as discounts for renewal premiums, thereby encouraging customers to buy the insurance. If a user does not file a claim due to an after-class tutoring institution's unannounced closure within the first year of purchasing the performance bond insurance, they will be recognized as a "high-quality service user" for that year. Correspondingly, in the next natural year of insurance coverage, the user will receive cumulative discounts when purchasing the insurance company's products offline or the claim settlement plans in the APP online again.

5. Conclusion

This paper conducts a systematic study on prepaid consumption risks in the education and training industry. By analyzing the industry status, policies and market demand, it designs a performance bonds scheme for such consumption and verifies its feasibility and implementation paths. The study shows that China's education and training industry, though large (with 490,000 existing enterprises), is "large but scattered" – 90% of the market is dominated by small and medium-sized institutions, which are vulnerable to crises due to weak anti-risk capabilities, affected by policies like the "Double Reduction" and the epidemic. From 2018 to 2022, complaints about education and training services rose from 20,521 to 80,528, with "refund difficulties" and "institutions running away" being prominent issues. Existing supervision methods such as third-party fund depository ensure capital security but restrict institutions' capital flexibility, failing to balance consumer rights and industry development.

Based on these pain points, the proposed insurance scheme adopts a core model of "commercial insurance + e-CNY + platform supervision": 30% of prepaid funds are

dynamically supervised via e-CNY, and 70% are guaranteed by insurance. This covers the entire process of prepaid funds safely while retaining institutions' right to use 70% of the funds. The scheme features multiple innovations: precise rate setting through credit rating and transition matrices, prepaid fund calculation formulas for different preferential measures, fully online claim settlement via OCR technology, and a "parent + merchant + management" three-terminal platform to improve service efficiency. Surveys indicate that nearly 60% of consumers are willing to purchase it, especially families with high education investment and long-term prepaid users. However, over 90% of consumers have insufficient understanding of such insurance, which is a major promotion obstacle.

To promote the scheme, policy suggestions are as follows: First, regulators should include this insurance in the industry's risk prevention system, establish a data-sharing mechanism with financial and educational departments, and offer filing convenience for insured institutions. Second, establish unified credit rating standards for after-class tutoring institutions, integrating operational data and complaint records to support insurance pricing. Third, strengthen consumer education through government platforms and mainstream media to popularize prepaid consumption risks and protection knowledge, enhancing insurance awareness. Fourth, encourage technological innovation, supporting cooperation between insurance companies and tech enterprises to optimize credit evaluation models and claim settlement systems, reducing operational costs.

In summary, the performance bonds for prepaid consumption of after-class tutoring institutions offers a feasible solution to industry pain points. It requires collaboration among the government, insurance institutions, and the education and training industry. Through policy guidance, technological empowerment, and market cultivation, it can achieve a win-win situation between consumer rights protection and the healthy development of the education and training industry.

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