

Analysis on the Impact of Rainstorm on Vehicle Damage Insurance in Inland China based on Abnormal Climate

Jiaming Li, Zunrong Li, Qiqi Li, Yixiao Yan

Financial School, Anhui University of Finance and Economics, Bengbu, Anhui 233030, China

Abstract

Under the influence of abnormal climate, heavy rains have occurred in Henan, Shanxi, Shaanxi and other inland areas of China, and the insurance industry has launched a number of measures to assist in emergency rescue and disaster relief. Among the disaster insurance claims caused by rainstorm, car damage insurance is the most common. After the reform of car insurance, the scope of application of car damage insurance has been greatly expanded. This paper first analyzes the current situation of rainstorm in inland China caused by climate anomalies since 2021. Mainly from the rainstorm frequency, occurrence area, insurance claim analysis. Secondly, it analyzes the causes of rainstorm, the losses caused and the breadth and depth of insurance claims. Taking Henan rainstorm and Shanxi rainstorm in 2021 as examples, the impact of rainstorm on vehicle damage insurance is analyzed. Finally, the countermeasures and suggestions are given.

Keywords

Abnormal Climate; Rainstorm Risk; Motor Vehicle Loss Insurance.

1. Introduction

Since 2021, under the influence of abnormal weather, China's inland areas of Henan, Shanxi, Shaanxi and other places have experienced heavy rainfall for many times, causing serious casualties and property losses. The root cause of the rainstorm is that global warming intensifies the instability of the climate system. Global warming has led to frequent and increased intensity of abnormal weather events such as rainstorm, flood, drought and typhoon in some areas. The rainstorm not only caused a large number of casualties, but also dealt a huge blow to the economy of the affected areas. After the disaster, the personal property of the people affected by the disaster was completely destroyed, among which motor vehicles were the most vulnerable to serious damage. With the improvement of living standards, the overall number of motor vehicles in our country has been climbing year by year. From 2012 to 2021, the statistics of motor vehicles and car ownership in our country are shown in Figure 1-1. There are frequent cases of vehicle loss caused by rainstorm, and the demand for vehicle loss insurance is increasing, which is not only reflected in the increase in the number of insurance, but also reflected in the hope of further broadening the coverage of vehicle loss insurance.

Natural disasters have become a hot topic in the society and academic circles all over the world. According to statistics, about 40% of the world's direct economic losses caused by natural disasters are caused by torrential rains and floods. China is one of the regions where rainstorm and flood disasters occur frequently. Flood and its secondary disasters caused by rainstorm in flood season each year have a great impact on regional social and economic development and pose a serious threat to residents' lives and property. The main form of insurance against rainstorm disasters is vehicle damage insurance, so it is of great value to study the impact of rainstorm on vehicle damage insurance.

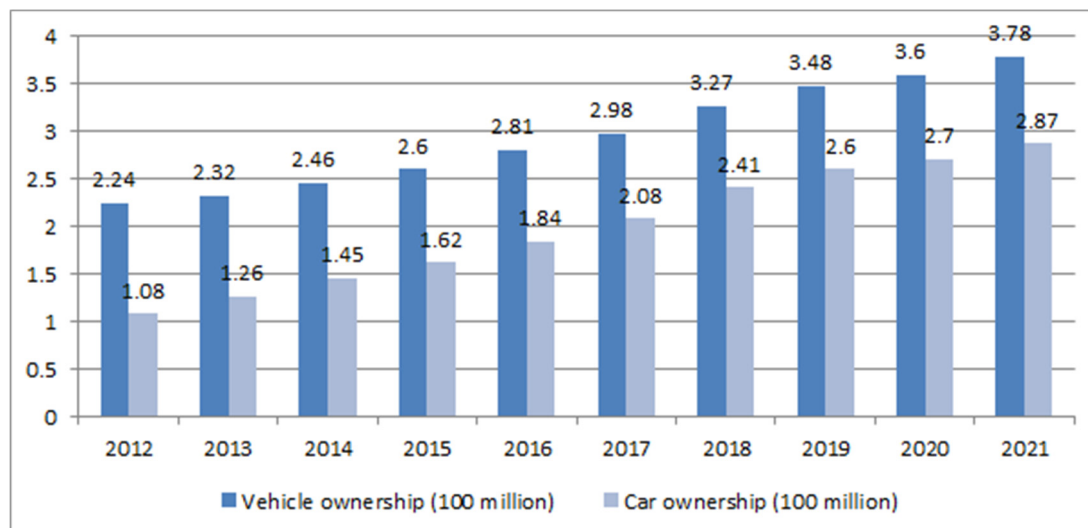


Figure 1. Statistics of vehicle and car ownership in china from 2012 to 2021

The research on the impact of rainstorm disaster on vehicle damage insurance has the following three meanings: First, improve people's life satisfaction. The erosion of torrential rain is likely to cause a large range of motor vehicle damage, and vehicle damage insurance can effectively compensate for the loss of personal property of residents in theory, and improve people's life satisfaction and happiness. Therefore, we need to adjust the coverage of vehicle damage insurance products according to the change of torrential rain disaster, and play the social stabilizer function of the insurance industry. Second, to improve the social reputation of insurance companies. In the face of great disasters and calamities, insurance companies are social stabilizers, and the compensation paid by insurance companies has also woven a protective net for the resumption of work and production by enterprises and the recovery of the lives of the public, thus supporting a large social umbrella. Heavy rain has brought heavy economic losses to the disaster-stricken areas in Henan Province, such as casualties, vehicle damage, collapse of houses, inundation of cultivated land, and interruption of company operations. Without timely payment of insurance, post-disaster reconstruction would be impossible.

2. Analysis on the Current Situation of Rainstorm in Inland China

China's vast territory, affected by tropical high pressure and atmospheric circulation, has sufficient precipitation all the year round, and its territory is surrounded by mountains and rivers. As a result, China has become one of the countries with frequent flood disasters in the world. Nearly two-thirds of the country's territory is affected by rainstorm weather and flood disasters. Therefore, it is extremely necessary to make an overall summary analysis of the rainstorm weather in our country.

2.1. The Definition and Classification of Rainstorm

According to the rules of Chinese meteorology, only heavy rainfall with rainfall over 50mm within 24 hours can be included in the scope of "rainstorm". According to its rainfall intensity, the rainstorm can be divided into three levels: those with rainfall of 50mm-99.9mm within 24 hours are called "rainstorm", those with rainfall of 100mm-249.9mm are called "rainstorm", and those with rainfall of more than 250mm within 24 hours are classified as "rainstorm". However, in the actual operation of the insurance business, the focus is more on the direct economic losses caused by storms. Therefore, people in the industry use the occurrence time

and the severity of the hazardous areas to classify storms: local storms, regional storms, large-scale storms and large-scale storms.

2.2. The Cause of the Formation of Rainstorm Disasters

Although rainstorm is a common natural phenomenon, its causes are not only natural factors, but also traces of human influence. With the frequent occurrence of flood-causing torrential rains that cause floods, disaster prevention and mitigation departments have begun to pay attention to the causes of such torrential rains, mainly including natural factors and human factors.

Natural factors mainly include climatic factors and geographical factors. Weather and climate factors are the direct causes of rainstorm disasters. Most of the rainstorms are due to natural rainfall phenomena formed under the influence of atmospheric circulation and climate system. However, when rainfall occurs, topography becomes an important factor that affects the occurrence of rainstorm disasters. Different terrain has different impacts on rainstorm disasters. Airflow will form flow around and climb over the plateau and mountainous terrain, which is easy to cause rainstorm. After heavy rainfall, the landform is prone to secondary disasters such as landslides and mudslides. The slope of the basin and the mountains and rivers is large, so it is not easy to form normal flood disasters. However, when there is persistent heavy rainfall, it may induce more serious floods to flood the city. In contrast, there are fewer disasters and fewer difficulties in the plain area, and the rainstorm mainly occurs in the form of flood and waterlogging.

With the increasing range of human activities, the impact of human factors on the rainstorm is becoming more and more significant, which is mainly manifested in three aspects: First, the destruction of forest vegetation, serious soil and water loss, and the destruction of the natural reservoir of forest. The second is to build fields around lakes, which reduces the flood storage capacity. At the same time, large areas of rivers are encroached on and the rivers, lakes and seas are destroyed, which weakens the flood discharge and storage capacity of natural systems. The third is the massive exploitation of groundwater, which makes the whole land subsidence and aggravates the danger of flood disaster.

2.3. Rainstorm under Abnormal Weather Conditions

Abnormal climate is the general term for severe floods, droughts, frost and other disasters in some places. The World Meteorological Organization defines abnormal climate as "a rare climate phenomenon occurring once in more than 30 years".

Since China entered the 1960s, extreme precipitation has increased year by year, and China's climate risk index has also shown an upward trend, especially after the late 1990s, the average intensity fluctuation of typhoons landing in China has been continuously increasing. The results of important indicators of the climate system show that the national climate warming continues and the risk probability of extreme weather has increased. The intuitive reflection of the intensification of abnormal weather is the increase in the frequency of rainfall events in our country. The average annual rainfall in our country has increased year by year, with an average increase of 5.1 mm every ten years. The rainfall in the north-central part of northeast China, Jianghuai-Jiangnan region and the western region increased significantly, while the annual rainfall in the south part of northeast China, most of Huanghuai region and the east and south parts of southwest region showed a significant downward trend. The above-mentioned rainstorm caused by the abnormal climate caused by global warming has a great impact on people's lives and social economy in our country, even causing casualties.

3. Typical Case Analysis of the Impact of Rainstorm Disaster on Vehicle Damage Insurance

The answer to the question of whether vehicles damaged by water immersion in the 2021 rainstorm can be settled will be very different around September 19, 2020. In 2020, China Banking and Insurance Regulatory Commission issued the "Guidance on Promoting Comprehensive Innovation of Vehicle Insurance", which will be implemented from September 19 of the same year. In the detailed rules for the reform of motor vehicle insurance, it is proposed to straighten out the main insurance and additional insurance liabilities of commercial motor vehicle insurance, and guide insurance companies to further expand the main insurance clauses of motor vehicle damage insurance on the basis of the existing insurance liabilities, and to increase the scope of guarantee obligations, such as theft and robbery of motor vehicles, simple breakage of glass, spontaneous combustion of vehicles and wading of engines, so as to provide more comprehensive and perfect motor vehicle insurance guarantee services for consumers.

In 2021, the specific compensation for car casualties caused by rainstorm should be judged according to the insurance policy coverage of the car owners and the results of exploration and damage determination. According to the detailed rules of comprehensive reform of China Motor Vehicle Insurance Company, the compensation mainly includes: if the car insurance is purchased before September 19, 2020, the car damage insurance and wading liability insurance must be purchased before the full amount of compensation can be obtained in case of an accident of the car engine. If only the vehicle loss insurance is purchased instead of the wading liability insurance, the insurer will determine the liability according to the circumstances for all vehicle losses except the engine according to the insurance terms. Those who buy a car after September 19, 2020 will receive a certain amount of compensation even if they do not have vehicle loss insurance, and will receive full compensation once they have vehicle loss insurance.

3.1. Henan Rainstorm

3.1.1. Henan Rainstorm Disaster Overview

From July 17 to 23, 2021, heavy rain occurred in all parts of Henan Province, and heavy rain (250~350 mm) occurred in Zhengzhou, Xinxiang, Kaifeng, Zhoukou and Jiaozuo.

3.1.2. Henan Rainstorm Insurance Claims Settlement

In the July 2021 rainstorm in Henan, the Henan insurance industry received 513,200 claims. According to the statistics of China Banking and Insurance Regulatory Commission, the estimated loss reached 12.404 billion yuan, accounting for more than 11% of the loss caused by the rainstorm, which has brought the proportion of insurance compensation for natural disasters to a new high. Up to December 1, 2021, the insurance industry had paid 501,000 cases and paid 9.704 billion yuan in compensation. The loss of motor vehicles caused by the rainstorm in Henan was the most serious, and the insurance companies reported more than 90% of the cases. In 2021, insurance companies paid more than 7 billion yuan for car insurance.

Table 1. Data of Insurance Companies Participating in Henan Rainstorm

| Insurance company | Cumulative net loss | Car insurance loss |
|--|---------------------|--------------------|
| The PICC Property and Casualty Insurance | 8.3 billion yuan | 3.4 billion yuan |
| Ping An Property Insurance | \$3.1 billion | / |
| Taikang Property Insurance | / | 12.72 million yuan |
| Total compensation | 12.4 billion yuan | 7 billion yuan |

After the rainstorm disaster, the insurance industry responded quickly and issued various emergency service measures, such as quickly accepting and handling cases, simplifying insurance claims and procedures, etc., which effectively played the role of insurance risk management, disaster prevention and mitigation.

According to official statistics, the insurance companies bear about 8% of the compensation in the Henan rainstorm, and the function of the insurance "social stabilizer" is gradually emerging. The performance of each property insurance company is as follows: the catastrophe compensation of PICC Property Insurance reached the highest value in nearly ten years in 2021, with a cumulative net loss of 8.3 billion yuan, of which 3.4 billion yuan was lost in vehicle insurance. The net loss of PICC Property and Casualty Insurance reached 3.1 billion yuan in the rainstorm in Henan, and typhoon fireworks and rainstorm in Hebei paid 900 million yuan and 500 million yuan respectively. It can be seen that the heavy rain has a great impact on PICC's property insurance losses, which account for as much as half of the total compensation for the whole year. Ping An Property Insurance received 70,600 reports during the rainstorm in Henan, among which 60,600 reports were filed for car insurance, accounting for 85.3%. The total compensation of Ping An Property Insurance exceeded 3.1 billion yuan. We can see from the 2021 annual report of Ping An of China that the automobile insurance market was affected by the rainstorm in Henan Province in 2021, resulting in an overall loss.

In addition, Taikang Insurance actively responded by issuing ten emergency service measures to cope with the rainstorm in Henan, and took the initiative to assume social responsibility. Taikang Online Car Insurance has received 424 reports with an estimated compensation of 12.72 million yuan. Insurance companies paid a total of 12.4 billion yuan in the Henan rainstorm, among which car insurance paid 7 billion yuan.

3.2. Shanxi Rainstorm

3.2.1. Shanxi Rainstorm Disaster Overview

From October 2 to 7, 2021, a large-scale heavy rainfall occurred in Shanxi Province, with the process rainfall in the whole province ranging from 15.4 mm to 285.2 mm. During the National Day, the emergency response to the rainstorm level 4 lasted for nearly 90 hours in Shanxi, and the continuous heavy rainfall throughout the province caused severe flood and waterlogging. The torrential rain in Shanxi province affected 1,757,100 people, affected 2,849,600 mu of crops and collapsed more than 17,000 houses in the province. The disaster was no less severe than the torrential rain in Henan in July of the same year.

The rainstorm disaster in Shanxi has caused landslides and traffic jams. On the night of October 5, 2021, a landslide occurred in Jingpo Village, Puxian County, Shanxi Province, killing four people. On October 6, the Nantong railway in Shanxi was washed away and the train was stopped. Affected by heavy rainfall, ancient buildings in Fencheng and ancient city walls in Pingyao collapsed.

This rainstorm disaster in Shanxi has two characteristics: regional and gradual. The regional characteristics are reflected in the more southward, the more serious the rainstorm disaster is, the more serious the rainstorm disaster is in the villages and towns. The gradual feature is reflected in a short period of heavy rainfall. The biggest difference between the rainstorm in Shanxi and the rainstorm in Henan in 2021 is that the latter is the disaster caused by continuous rainfall. In this case, time can be set aside for emergency rescue and relief work. The former increases the difficulty of emergency rescue work and brings huge difficulties to emergency rescue work.

3.2.2. Shanxi Rainstorm Insurance Claims Settlement

According to incomplete statistics, each insurance company accepted a total of 3,477 claims settlement cases during the rainstorm in Shanxi, with the loss amount of vehicles reaching 15,995,400 yuan and the estimated loss amount of other properties reaching 47,928,100 yuan. Ping an property insurance company has received a total of 2,159 online reports of car insurance and property insurance, and has completed 1,615 cases. the fastest time to complete the cases is only 12 minutes. this has fully improved the efficiency of claims settlement and achieved "early compensation and quick compensation". The Shanxi branch of PICC received 253 reports of flooding accidents caused by torrential rain in Shanxi, 1,186 reports of enterprise property insurance, home property insurance, and 500 reports of agricultural insurance. The Shanxi branch of China Life Insurance Company launched the emergency plan for major emergencies immediately after the rainstorm disaster in Shanxi to respond to the disaster relief. The Shanxi branch of China Life Insurance Company paid RMB1,562,100 in the rainstorm in Shanxi.

On the whole, the insurance companies responded quickly to the torrential rain in Shanxi, actively started the green channel of claim settlement, simplified the process and procedures of various claims settlement, and achieved the goal of full compensation and quick compensation.

3.3. The Impact of Heavy Rain on Vehicle Damage Insurance

Before the comprehensive reform of vehicle insurance, the insurer confirmed in the insurance clauses of vehicle damage insurance that the vehicle casualties caused by the rainstorm were within the scope of the insurer's responsibility, and on the other hand, the loss caused by the flooding of the vehicle engine was also determined as a deductible item in the vehicle loss insurance. Therefore, in practice, there are many disputes over the insurance of the insured vehicles caused by the flooding of automobile engines caused by the rainstorm. In the judicial practice, the dispute about the liability of the automobile engine water intake insurance caused by the rainstorm also follows.

After the comprehensive reform of car insurance, car damage insurance can greatly ease the loss of car owners.

Purchased the insurance policy for car damage insurance after September 19, 2020, and can directly claim compensation if the vehicle is flooded while parked in situ. However, if they were purchased before, they must purchase separate wading liability insurance. If you do not buy water-related insurance in the course of driving, only the part other than the engine will be compensated. In addition, most of the insurances will not claim for the engine if the car is restarted after the water-related flameout.

In fact, there are not a few who do not purchase motor vehicle loss insurance separately, and even some owners only purchase compulsory insurance. However, judging from the historical data, there is still a huge gap between the number of motor vehicle insurance policies and the number of vehicles, which also shows that there is a "fish missing insurance". Taking Henan Province as an example, according to the data of Henan Provincial Banking Supervision Bureau, the total premium income of motor vehicle insurance from January to May 2021 was more than 16,655 million, and the number of motor vehicle insurance policies was 13,502,100. However, the "Report on the National Economic and Social Development of Henan Province in 2020" indicates that by the end of 2020, the number of civilian vehicles in Henan Province has reached 17,591,700.

To sum up, there are three kinds of claims settlement situations for motor vehicle damage caused by rainstorm:

First, there is a car damage insurance, the car stopped state was flooded. The insurance company will pay the full compensation for the repairs.

Second, if there is car damage insurance, but the car suddenly shuts down or is flooded in the process of driving. If the new insurance policy purchased before the comprehensive reform of the car has water-related risks, the insurance will be responsible for the compensation; If there is no water-related insurance, only the part other than the engine can be compensated. The insurance company will be responsible for the compensation of the new insurance policy purchased after the car comprehensive reform, regardless of whether there is any water-related insurance.

Third, the insurer does not bear the compensation for the restart of the car after the water-related stall.

4. Analysis of the Impact of Rainstorm on Vehicle Damage Insurance

4.1. The Impact of Property Insurance Companies

As a pillar product of property insurance companies, the premium income accounts for about 75% of the total. The amount of premium income directly relates to the overall revenue and expenditure and profit level of property insurance companies. As an important component of car insurance, the change in premium income of car loss insurance has a greater impact on the level of car insurance income. As shown in Figure 2, from the insurance premium income data of a large property insurance company in China, it can be seen that the insurance premium income has been growing slowly in the first few years of the establishment of the insurance, until the following year, affected by the rainstorm disaster, the demand for the insurance increased significantly and the insurance premium income of the insurance increased significantly. In recent years, the premium income of car damage insurance has basically reached the bottleneck, the premium growth rate has been reduced from 60% to less than 1%, further opening of the car damage insurance market is facing difficulties.

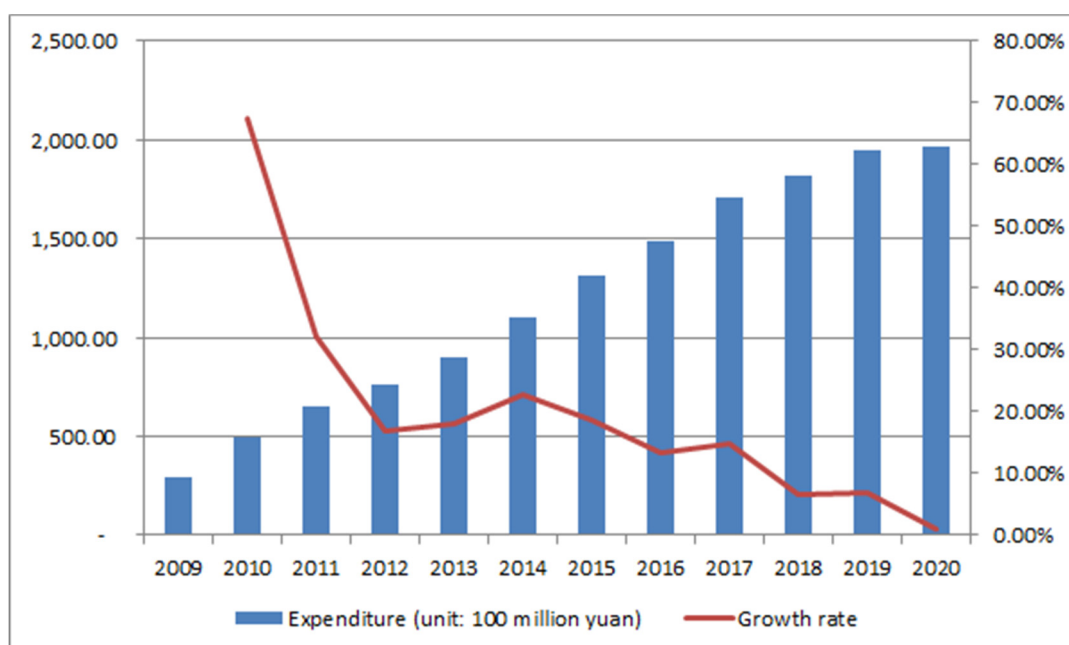


Figure 2. The premium income and growth rate of vehicle damage insurance of a property insurance company

Correspondingly, the payment of vehicle damage insurance basically coincides with the trend of premium income, as shown in Figure 3. The difference is that the growth rate of premium income has decreased significantly in recent years, while the payment expenditure has maintained a certain growth rate. This reflects that the profit of car damage insurance will decrease year by year in the foreseeable future. On the whole, the rainstorm has brought about an increase in the short-term income of property insurance companies. However, with the increase in the willingness and number of high-risk people to apply for insurance, the profits from car damage insurance will gradually shrink or even short-term losses may occur.

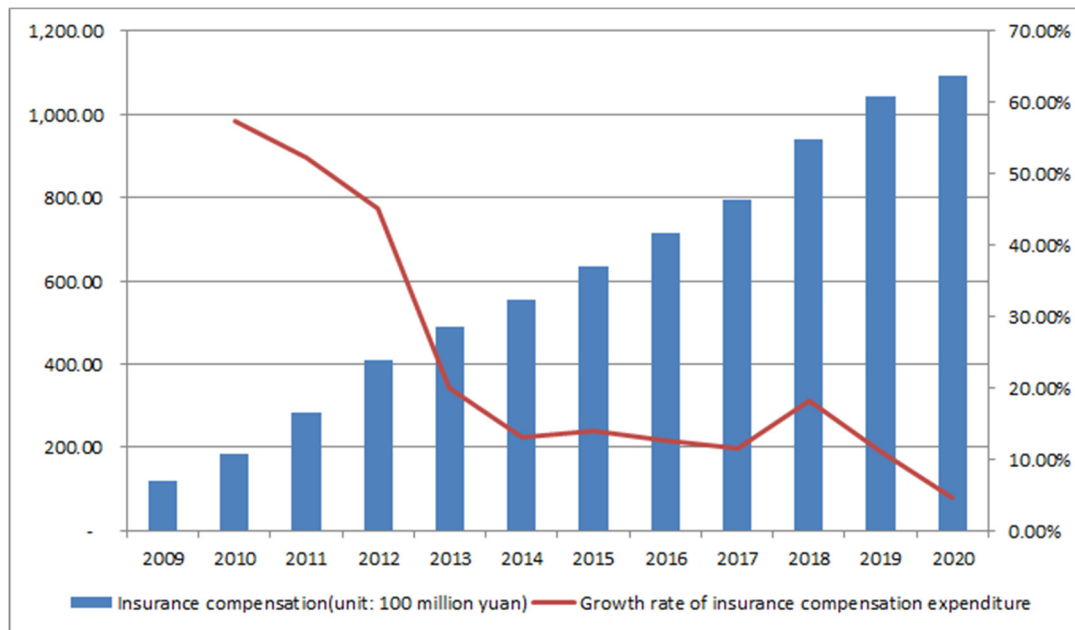


Figure 3. Payment and growth rate of vehicle damage insurance of a property insurance company

4.2. The Impact of the Government Level

No matter for commercial insurance or social insurance, the development of various types of insurance cannot be separated from the policy guidance and support of governments at all levels. From an overall point of view, in 2019, when the vehicle loss insurance reform policy was introduced, commercial insurance companies responded one after another to promote the comprehensive renewal of the vehicle loss insurance payment conditions. In the subsequent rainstorm disaster, the water-related insurance contracted by default in the new vehicle loss insurance provided protection for many affected people, which was helpful to the post-disaster order reconstruction and economic recovery.

In addition, the actions of local governments play an important role in the compensation of car damage insurance under the rainstorm disaster. Judging from the rainstorm disasters in Henan and Shanxi, most of the vehicles were not damaged in the rain, but soaked in the water, causing the engine to wade and damage. This situation is likely to be affected by the construction of the city's own drainage system. In order to distinguish the concepts of rainstorm waterlogging and rainstorm waterlogging, it can be distinguished according to the waterlogging depth. When the water depth of the road surface reaches 5cm, it is called ponding; When the depth of accumulated water is 5-15cm, it is called serious accumulated water; When the water depth exceeds 15cm, it is called rainstorm waterlogging. Therefore, the payment of car damage insurance in the rainstorm disaster largely depends on the local government's construction of Sponge City.

4.3. Impact at the Consumer Level

The impact of rainstorm weather on vehicle damage insurance at the consumer level is mainly concentrated on the change of demand level. The first is a big increase in demand. As direct victims of rainstorm weather and members of frontline personnel involved in disaster relief who have experienced the actual harm of extreme rainstorm weather from zero distance, they have the most intuitive feeling about the possible casualties and property losses caused by such disasters, which directly drives the expansion of the demand market for vehicle damage insurance. However, through the government's follow-up report on the rainstorm disaster and the publicity from third parties such as insurance companies, the national awareness of disaster prevention and prevention is also constantly increasing. It can be said that the frequent occurrence of rainstorm weather has directly driven the growth of the demand side of vehicle damage insurance in our country.

On the other hand, consumers' demand for the coverage of car damage insurance is also constantly expanding. The comprehensive reform of car damage insurance is the best example. The frequent occurrence of extreme weather has greatly increased the probability of flooding the vehicle, but the insured who has taken out the vehicle damage insurance will not be compensated, although according to the provisions of the insurance contract, the water-related insurance was an additional insurance before the reform, requiring consumers to take out the insurance separately. However, from the perspective of outcome theory, vehicle damage accidents frequently occur, while insurance companies often refuse to pay compensation, which is not conducive to the image building of the insurance industry and makes vehicle damage insurance become a decoration to a certain extent. Therefore, the comprehensive reform policy of vehicle damage insurance has been introduced. First, the scope of coverage of vehicle damage insurance has been standardized. It also caters to the needs of most consumers. However, it is not only the case that the engine wades into the water that the vehicle is damaged by the rainstorm weather, and the vehicle may be damaged by the reasons such as the rusting of the vehicle caused by the rain wash, the aging of the sealing strip of the vehicle body caused by the long-term water immersion of the vehicle, and the corrosion of the vehicle body caused by the acid rain in the city.

5. Countermeasures and Suggestions on Vehicle Damage Insurance Under the Background of Extreme Rainstorm

Extreme weather, such as heavy rain in abnormal weather, has caused serious losses to people and property, and also brought severe challenges to the insurance industry. The disasters caused by the rainstorm are of many types, wide distribution and serious degree, which makes the claims settlement service of the insurance industry facing a severe test. According to the summary of the above-mentioned extreme rainstorm cases and the analysis of the impact of rainstorm weather on vehicle damage insurance, and combining with the actual situation of vehicle damage insurance, this paper puts forward some improvement ideas on vehicle damage insurance under extreme weather environment from the following aspects.

5.1. Adjust the Vehicle Damage Insurance Rate Appropriately

With the influx of a large number of high-risk people, vehicle damage insurance will also encounter more severe adverse selection problems. In order to fully mobilize the enthusiasm of commercial property insurance companies and maintain the protection of vehicle damage insurance, property insurance companies should appropriately adjust the vehicle damage insurance rates or optimize the rate determination model to ensure the normal operation of the insurance products. At present, there are mainly three pricing methods for car damage insurance in the world: pricing according to the insured amount; Pricing by vehicle category,

such as motor vehicle use, motor vehicle emissions, etc.; Pricing by model. Among them, pricing by vehicle type is the pricing method adopted by most developed countries. However, different from the national conditions of other countries where there are only 20 to 40 types of vehicles, there are tens of thousands of types of motor vehicles commonly used by Chinese residents, making it more difficult to price by vehicle type. In addition to these three methods, the third party may also be considered to estimate the actual value of the vehicle to determine the rates.

5.2. Improve the Resilience of Urban Waterlogging Disaster Management

In order to improve the ability of waterlogging control, the first thing is to cultivate and enhance the awareness of urban waterlogging prevention. Behavior and consciousness often complement each other. Cultivating the awareness of prevention is helpful to prevent urban waterlogging from the source. From this perspective: First, we need to cultivate the concept of the overall situation. Urban waterlogging is not only related to the change of local climate, but also related to the change of global climate. Attention to global climate change is helpful to raise the awareness of urban waterlogging. The second is to raise the sense of ownership. Residents are the owners of cities and towns. Establishing citizens' sense of ownership and raising citizens' awareness and concern about urban waterlogging can greatly strengthen the early warning capability of urban waterlogging. Secondly, it needs active learning and active reflection. The prevention of urban waterlogging puts forward high requirements for all aspects of the city. Therefore, it is necessary to continuously learn and update the relevant knowledge of waterlogging. At the same time, it is also necessary to actively learn new scientific and technological means such as the Internet and big data and establish an information transmission mechanism. After the measures to prevent waterlogging are put into practice, continuous reflection and improvement are required. Finally, the level of early warning and monitoring of waterlogging risk should be improved. Establishing a timely waterlogging risk early warning is one of the forward-looking measures to improve waterlogging prevention capability. The early warning mechanism can detect the precursor of waterlogging disaster in advance and nip waterlogging disaster in the bud, so as to minimize urban losses.

5.3. Broaden the Scope of Vehicle Damage Insurance

With the continuous expansion of consumer demand side, the supply side of vehicle damage insurance should also be appropriately expanded. Insurance practice not only needs theoretical guidance, but also draws on past operating experience. If we want to give full play to the functions of insurance in preventing disasters and losses and stabilizing social order, we must adjust the scope of insurance to meet the reasonable insurance demand as far as possible. In a rainstorm disaster, motor vehicles may bear risks that are not or are difficult to meet in daily life, such as damage caused by engines wading in water. Frequent and abnormal rainfalls increase the risks borne by consumers and raise the expectations and requirements for car damage insurance. Property insurance companies should identify these new risks, separate out the insurable risks and include them in the coverage of car damage insurance according to the circumstances after accurate calculation, or incorporate them into a part of the coverage of the main insurance, or appear in the form of additional risks to meet the growing demand of consumers for insurance.

Acknowledgments

Anhui University of Finance and Economics graduate research and innovation fund project "Analysis on the Impact of Rainstorm on Vehicle Damage Insurance in Inland China Based on Abnormal Climate" (ACYC2021310).

References

- [1] Yin Laisheng. Research on urban waterlogging prevention and control strategies from the perspective of tough city-taking the "May 22" rainstorm in Guangzhou as an example [J]. Urban Observation, 2022,(02):43-51+161.
- [2] Liu Zhansheng. Research on the Countermeasures of Rainstorm and Flood Disasters in Modern Cities [J]. Northern Economy, 2022,(02):70-72.
- [3] Pan Yafeng, Wei Xu. Study on the spatio-temporal pattern and vulnerability of motor vehicle losses caused by rainstorm in Shenzhen [J]. Cities and Disaster Reduction, 2019,(06):28-33.
- [4] Jiao Sheng, Ma Bo, Li Bei. Research progress on causes and prevention and control strategies of urban waterlogging in China [J]. Ecological economy, 2019,35(07):92-97.
- [5] Zhao Weiji. Strategies to improve the management of auto insurance [J]. Taxes, 2018,(08):208.
- [6] Zheng Yan, Zhai Jianqing, Wu Zhanyun, Li Ying, Shi Weina. Classification Evaluation of Resilient Cities Based on Adaptive Cycle: A Case Study of China's Sponge Cities and Climate-Adapted Cities [J]. china population resources and environment, 2018,28(03):31-38.
- [7] Chen Li, Zhu Xigang, Sun Jie. The basic concept, action mechanism and planning vision of a resilient city [J]. Modern City Research, 2017,(09):18-24.
- [8] Wang Tianqi, Li Gangqiang. Analysis on the development of auto insurance market-taking auto damage insurance as an example [J]. China Business Theory, 2016,(26):139-140.
- [9] Dai Yijun. Some Suggestions on Improving the Profitability of Automobile Insurance [J]. Financial Economy, 2015,(14):96-97.
- [10] Zhang Qiang, Wang Zhaodi, Chen Hao. Analysis of the current situation and future prospects of the way to determine the amount of car damage insurance [J]. Shanghai Insurance, 2015,(03):48-51.