

Study on the Influence of Regulatory Penalty on the Business Performance of Life Insurance Companies

Bin Hu, Yingjie Ma

Nanjing Audit University, Nanjing 211815, Jiangsu, China

Abstract

As an important part of micro-prudential supervision, regulatory punishment is of great significance for preventing and resolving major risks in the life insurance industry and guiding the steady operation of life insurance companies. In the policy environment of increasing supervision, the impact of regulatory punishment on the business performance of life insurance companies has gradually become a hot topic of academic research. Based on the micro data of 48 life insurance companies in China's life insurance industry from 2010 to 2021, this paper empirically examines the impact of regulatory penalties on the business performance of life insurance companies. The study shows that the short-term regulatory penalty suppresses the business performance of life insurance companies, and it still takes time to exert the positive effect of microprudential supervision. This conclusion is established after stability testing and endogenous treatment. The mechanism analysis shows that the regulatory penalty has a negative impact on the overall business performance of life insurance companies by improving the heterogeneity analysis shows that the regulatory penalty has a more significant negative impact on the business performance of Chinese-funded holding, non-bank and compensation generation. The research in this paper enriches the empirical evidence on the effectiveness of regulatory penalties, and provides theoretical support for the establishment of a long-term mechanism to prevent and defuse risks in the insurance industry.

Keywords

Regulatory Penalties; Life Insurance Company; Business Performance.

1. Introduction

At the Central Financial Work Conference in 2023, the CPC Central Committee proposed for the first time the goal of becoming a financial power, taking promoting high-quality financial development as a strong support for Chinese-style modernization, which means that the role and status of the financial sector in supporting the development of the real economy have been greatly enhanced. However, due to the influence of internal and external uncertainties, China still has a long way to go to prevent and resolve financial risks. At present, China has basically formed a regulatory pattern system coordinating macro-prudential supervision and micro-prudential supervision, in order to maintain the overall stability of China's financial system.

As the "Shock Absorber" of the economy and the "stabilizer" of the society, the insurance industry plays an important role in China's financial system. Compared with property insurance companies, life insurance companies have a more obvious role and significance in providing long-term funds and serving the peoples livelihood, so the stable operation of life insurance companies is crucial. As an important tool and means to implement micro-prudential supervision, regulatory punishment aims to give full play to the long-term normative and guiding role of regulation in the life insurance industry by strengthening the attention to the operational risks of individual life insurance companies. However, the intensity of regulation

and the development of the industry often appear in a short period of time. The regulatory pressure brought by regulatory penalties may have an uncertain impact on the operation of life insurance companies, and the effectiveness of regulatory penalties needs to be further tested.

Based on the micro data of 48 life insurance companies in China's life insurance industry from 2010 to 2021, this paper empirically analyzes the impact of regulatory penalties on the business performance of life insurance companies. The possible marginal contribution of this paper lies in: first, Most of the existing research is based on solvency regulatory requirements, From the perspective of administrative punishment, By collecting the regulatory penalties on life insurance companies, It makes up for the relative deficiency of the quantitative research on the administrative punishment in the insurance industry; second, Unlike most of the literature that conducts empirical studies using samples excluding companies in the financial industry, In this paper, the selection of research objects and samples has jumped away from the routine, Focusing on studying the impact of regulatory penalties on the insurance industry, And further narrowed the scope to life insurance companies, It provides empirical evidence for the study of the relationship between regulatory penalty and the business performance of life insurance companies; third, The changing trend of the regulatory system based on classified supervision and differentiated supervision, This paper further explores the impact of regulatory penalties on life insurance companies with different characteristics, In order to provide inspiration for policy making.

2. Literature Review and Research Hypotheses

2.1. Study on the Effectiveness of Regulatory Penalties

From the existing literature, most of the studies on the effectiveness of regulatory penalties are conducted at listed companies. The research of Yu Yingze et al. (2023) shows that administrative punishment can play a "spur effect" to promote the long-term growth of enterprises. The research evidence of Zhu Song et al. (2023) indicates that the increased regulatory intensity will promote the reduction of overrating phenomenon. Gu Xiaolong et al. (2016) believe that illegal regulation can reduce the synchronization of stock prices of listed companies and ease the degree of information asymmetry.

Focusing on the financial field, most of the research on the effectiveness of the existing literature on regulatory penalties is carried out around commercial banks. The study of Minglei et al. (2019) found that there is a close relationship between regulation and banks risk preference, with a negative correlation between regulatory punishment and banks risk preference, while regulatory tolerance is positively correlated with banks risk preference. Research by Wang Wei and Wang Zhidan (2023) shows that regulatory penalties can improve banks operating performance. Pan Min and Wei Jiarui (2015) empirically studied the non-equilibrium panel data of 71 commercial banks from 2003 to 2013, and then reached the conclusion that the improvement of regulatory intensity has a risk suppression effect on the banking industry.

However, some studies have provided evidence for the ineffectiveness of regulation. The research of Song Yunling et al. (2011) shows that the punishment of securities supervision has no significant inhibitory effect on the occurrence probability of performance forecast violations of listed companies. The study of Chu Jian and Fang Junxiong (2021) found that after the occurrence of the regulatory punishment, the financial misstatement of the illegal company was significantly reduced, while the financial misstatement of the illegal company increased significantly, and the indirect deterrent effect of the regulatory punishment failed. The conclusion of Guo Feng et al. (2023) shows that when listed companies receive regulatory penalties, their cumulative excess returns will be significantly negative in the short term. Chen Juanjuan and Hou Juan (2015) pointed out that the effectiveness of the homogenization of

banking supervision is still questionable. The study of Li Qian et al. (2023), based on the non-balance panel data of 900 rural banks, pointed out that quantitative positioning supervision has a restraining effect on the business performance of rural banks.

At present, there are relatively few academic research studies on the effectiveness of regulatory penalties in the insurance industry. Most of the qualitative research starts from the level of supervision system, and points out that on the basis of the current classified supervision, explore the implementation of more detailed differentiated supervision system to improve the effectiveness of insurance supervision. There are also some quantitative studies to quantify the effectiveness of regulatory penalties in the insurance industry to explore the impact of regulatory penalties on the insurance industry. The study of Xiao Yugu et al. (2019) uses the two indicators of timeliness and the rate of repeated violations to measure the efficiency of insurance supervision, and the empirical results show that the effectiveness of insurance supervision is improving year by year. Guo Ruixin et al. (2022) empirically tested the relationship between administrative penalty and insurance contract litigation, and the results show that there is a positive correlation between administrative penalty and the risk of the insurance company being sued.

2.2. Regulatory Penalties and Business Performance of Life Insurance Companies

The business performance of life insurance companies is generally affected by both internal and external factors. In terms of internal factors, the company size, internal governance, equity structure and characteristics of the board of directors will have different influence on life insurance company business performance, at the same time, in terms of external environment, the national economic development and life insurance industry macro management policy, Internet finance, commercial Banks, for the second generation implementation factors can also affect the business performance of the life insurance company.

As an external factor, regulatory penalty may have two effects on the business performance of life insurance companies.

On the one hand, regulatory punishment can play a role of supervision and restraint, guide life insurance companies to control operational risks, and then have a positive impact on their business performance. First of all, regulatory punishment can promote life insurance companies to pay more attention to compliance management and strengthen compliance awareness, so as to reduce the risk exposure of greater losses caused by violations. Moreover, compliance operation can improve the reputation and customer trust of life insurance companies, which is conducive to the improvement of their business performance. Secondly, the life insurance companies can take the opportunity of the regulatory punishment to timely deal with the problems exposed in the company's internal control, and further improve the internal control system, optimize the internal management process, improve the management efficiency, so as to improve the business performance. Moreover, regulatory penalties may promote life insurance companies to carry out business transformation, adjust business structure, optimize product lines and services, so as to better adapt to regulatory requirements and market changes, and improve their competitiveness and business performance. Finally, the regulatory penalty may also break the original business model and thinking pattern of life insurance companies, promote life insurance companies to carry out innovation and reform, actively explore new business models, products and services, stimulate innovation vitality, and improve business performance.

On the other hand, the restrictions and corrections brought about by regulatory requirements may affect the normal business activities of life insurance companies in the short term, reduce their operating efficiency, and then have a negative impact on their business performance. First of all, regulatory penalties may lead to financial losses, such as fines, compensation, etc. These

financial losses will directly reduce the company's profits and reduce their profitability, and thus have a negative impact on business performance. Secondly, regulatory penalties will cause damage to the reputation of life insurance companies, reduce the trust of consumers and investors in the company, thus increasing the difficulty of product sales and financing costs, and affect the business performance of the company. Moreover, the result of regulatory penalties may limit some of the business activities of life insurance companies, such as restricting the sale of certain products and prohibiting access to certain markets, which may reduce the market share and revenue scale of the company, which will have a negative impact on business performance. Finally, the administrative penalty may also lead to the change of the senior management personnel of the life insurance companies, which will affect the stability and consistency of the management team, and then cause the normal operation and performance of the company to produce top-down uncertainty.

Considering the above analysis, this paper proposes the following competitive assumptions:

H1: Regulatory punishment has a promoting effect on the business performance of life insurance companies.

H2: Regulatory punishment has a restraining effect on the business performance of life insurance companies.

3. Study Design

3.1. Sample Selection and Data Source

In this paper, the micro data of 48 life insurance companies in China's life insurance industry from 2010 to 2021 were selected as the research samples, and the research samples were preliminarily treated as follows: (1) excluding the missing samples of key variables; (2) excluding the samples of the newly established life insurance companies established from 2010 to 2021; (3) reducing the tail of all continuous variables by 1% to reduce the influence of extreme values. After processing, 530 valid sample observations were finally obtained. In terms of data sources, the relevant data of the regulatory penalties of life insurance companies come from the website of the State Administration for Financial Regulation, while the data of the characteristic variables of other life insurance companies come from the CSMAR database, the website of the Insurance Association and the annual report of life insurance companies.

3.2. Variable Definition and Model Setting

3.2.1. Interpreted Variable: Business Performance of the Life Insurance Company (ROE)

Reference Zhang Jiatong (2021), Zheng Lijia (2020), this paper selects the return on net assets (Return on Equity, hereinafter referred to as ROE) as a measure of life insurance company business performance, the index for the ratio of net profit and average net assets, reflects the income level of shareholders equity, can measure the efficiency of life insurance company using its own capital and the final result of business management.

3.2.2. Explanatory Variables: Regulatory Penalties (Penalty)

Existing research mainly through the regulatory penalty amount, regulatory penalty amount and assets ratio, regulatory punishment, whether to measure micro prudential supervision of regulatory punishment (Ming ray, 2023), compared with the regulatory penalty amount, regulatory penalty times more comprehensive reflects the regulatory punishment, including fines, warning, shall be ordered to correct, disqualified, etc. So this paper refer to Lu Yuxuan and Zhao Guiqin (2023), using the number of regulatory penalties (Penalty) to the life insurance companies, specifically, the regulation of a life insurance company by the annual regulatory administrative penalties of the sum, and in order to facilitate the regression analysis, this paper to the number of regulatory penalties do add 1 and take natural logarithmic processing.

3.2.3. Other Control Variables

Considering other factors that may affect the business performance of life insurance companies, this paper refers to the existing literature, including asset size (Size), earned premium (Premium), reinsurance rate (Reinsure), compensation ratio (Compensation), net asset ratio (NAR) as control variables. Variables defined and illustrated are shown in Table 1.

Table 1. Variable definitions and instructions

type	name	symbol	defined declaration
explained variable	business performance	ROE	Net profit / average net assets in the past two years: 100%
explanatory variable	Regulatory penalties	Penalty	The number of times that a certain life insurance company is punished by the supervision department in a certain year + 1, take the natural logarithm
controlled variable	asset size Earned premiums Reinsurance rate Compensation ratio Net asset ratio	Size Premium Reinsure Compensation NAR	Total assets take the natural log Have earned insurance premium takes natural log Premium split / insurance business income is 100% Compensation expenses / insurance business income of 100% (Total assets-total liabilities) / total assets of 100%

3.2.4. Model Setting

In order to test the relationship between regulatory penalty and business performance of life insurance companies, the following regression model is constructed:

$$ROE_{i,t} = \beta_0 + \beta_1 Penalty_{i,t} + \gamma CVs_{i,t} + \varepsilon_{i,t} \tag{1}$$

Among them, $ROE_{i,t}$ is the measurement index of the business performance of the life insurance company, namely, the return on equity, the greater the value indicates the better business performance of the life insurance company; $Penalty_{i,t}$ is the administrative penalty of the regulatory company; if the regression coefficient of β_1 is significantly positive, it means that the regulatory penalty is beneficial to the improvement of the life insurance company, otherwise the regulatory penalty may inhibit the business performance of the life insurance company in a short time; $CVs_{i,t}$ is the control variable; $\varepsilon_{i,t}$ is the error term.

4. Empirical Analysis

4.1. Descriptive Statistics

Descriptive statistics results for the main variables are shown in Table 2. The mean business performance ROE of life insurance companies was 2.321, the median was 4.980, and the standard deviation was 20.25, indicating that there were obvious differences in business performance among different life insurance companies. The minimum value of regulatory penalties (Penalty) was 0.000, the maximum value was 2.708, and the standard deviation was 0.626, indicating that the frequency of regulatory penalties for different life insurance companies in the sample was quite different. Descriptive statistics for the remaining control variables were in reasonable intervals.

Table 2. Descriptive statistical results for the main variables

Variable	N	Mean	p50	SD	Min	Max
ROE	530	2.321	4.980	20.25	-92.19	43.78
Penalty	530	0.311	0.000	0.626	0.000	2.708
Size	530	24.58	24.43	1.743	20.60	28.81
Premium	530	22.84	22.78	1.886	17.50	26.91
Reinsure	530	5.855	1.555	13.03	-0.630	81.06
Compensation	530	14.27	10.64	12.91	0.060	65.44
NAR	530	12.50	10.11	9.457	1.770	61.44

4.2. Benchmark Regression Analysis

Table 3 report the benchmark of regulatory penalties and life insurance company performance regression results, the results show that the regression coefficient of regulatory penalty agency variable (Penalty) at 1% level significantly negative, shows that from the sample selected in this paper, regulatory penalties on the operating performance of life insurance companies, it shows that regulatory penalties in the short term may affect the business operation and scale expansion of life insurance companies, the positive effect of regulatory play still need time, the results support the research hypothesis H2.

Table 3. Benchmark regression results

	(1)
	ROE
Penalty	-5.842***
	(1.344)
Size	4.914***
	(1.298)
Premium	1.959*
	(1.166)
Reinsure	-0.119*
	(0.066)
Compensation	0.050
	(0.063)
NAR	0.265***
	(0.098)
_cons	-164.744***
	(15.048)
N	530
r2	0.270
r2_a	0.262

Note: ***, ** and * are significant at 1%, 5% and 10%, respectively, with t value in parentheses, the same as in the table below.

4.3. Robustness Test and Endogeneity Treatment

To ensure the robustness and reliability of the benchmark regression results, the following robustness test and endogeneity treatment are carried out:

4.3.1. Replace the Explained Variable

In view of the particularity of the business operation of insurance companies, the profit margin of premium income is one of the important indicators that cannot be ignored when analyzing

the profit of insurance companies. Specifically, the profit margin of premium income is the ratio of net profit and premium income, which can reflect the ability of insurance companies to use insurance business income to create profits. Therefore, this article selects the premium income Profit margin (Profit), as the replacement variable of RR ROE, was added to the model (1) for reregression, and the regression results are shown in Table 4. It can be seen that the coefficient between regulatory penalty (Penalty) and premium income profit margin (Profit) is significantly negative, indicating that the research hypothesis H2 is still valid after replacing the explained variables, and the conclusion of this paper is robust.

Table 4. Robustness test: to replace the explained variables

	(1)	(2)
	ROE	Profit
Penalty	-5.842***	-4.035***
	(1.344)	(1.374)
_cons	-164.744***	-95.496***
	(15.048)	(15.383)
CVs	Yes	Yes
N	530	530
r2_a	0.262	0.260

4.3.2. The Explanatory Variables Lag Behind the First Phase

Given the impact of regulatory penalties on the management of life insurance companies may have time delay and sustainability, and in order to further control the endogenous problem, this paper lags the explanatory variable regulatory penalties (Penalty), and the lag of regulatory penalty (L.Penalty) as a new explanatory variable to the model (1) for regression, regression results as shown in Table 5. The results showed that the coefficient of the lagging regulatory penalty (L.Penalty) was still significantly negative, which again verified the robustness of the conclusion of this paper.

Table 5. Robustness test: explanatory variables lag one phase

	(1)	(2)
	ROE	ROE
Penalty	-5.842***	
	(1.344)	
L.Penalty		-5.843***
		(1.366)
_cons	-164.744***	-156.562***
	(15.048)	(16.125)
CVs	Yes	Yes
N	530	470
r2_a	0.262	0.261

4.3.3. Placebo Test

To reduce the impact of other potential random factors on the results of this paper, a placebo test was conducted. First, the regulatory penalty times (Penalty) was randomly matched with the existing sample 500 times, and the estimated coefficient β and variance se of Penalty obtained from the 500 random matching regression were collected and sorted out, and then the t statistical value was calculated according to the formula $t = \beta/se$, and the distribution of t statistical value was investigated. The test results are shown in Figure 1. The t statistics are largely distributed around 0 and follow a normal distribution, indicating that most of the

estimated coefficients are not significant, in line with the expectations of the placebo test, which means that the conclusion of this study is not driven by other unobserved factors and has some robustness.

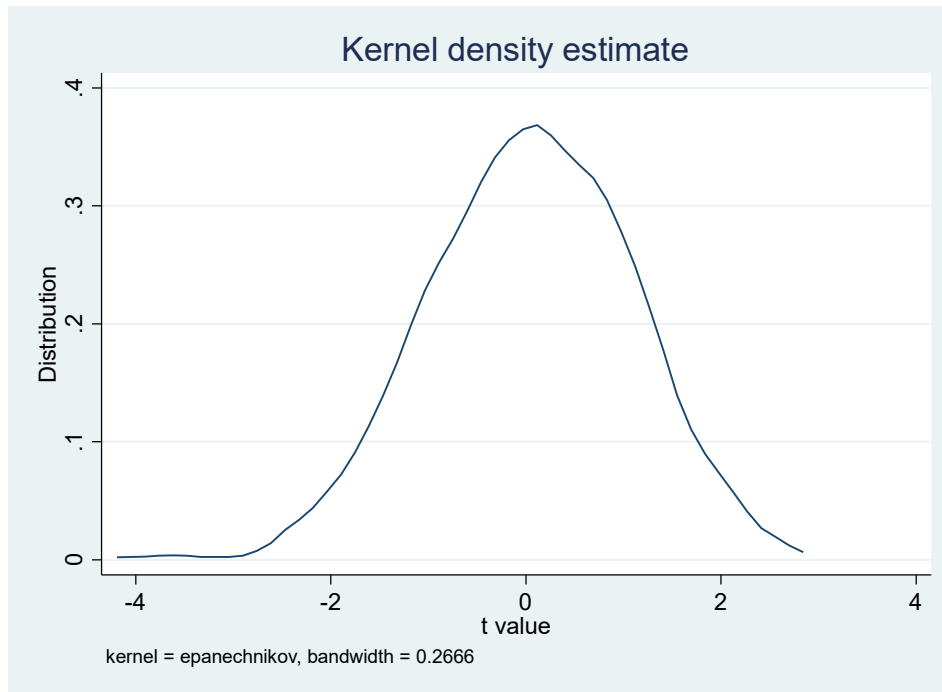


Figure 1. placebo test results

4.3.4. PSM Propensity Matching Score Method

In order to alleviate the endogeneity problem due to sample selection bias, this paper uses the PSM propensity matching score method to test the correlation. First, the study sample was divided into experimental groups and control group according to whether the life insurance companies were subject to regulatory penalties. Secondly, the aforementioned control variables were used as covariates to match 1:3 nearest neighbor, obtain a total of 190 observations, and then conduct regression test. The results are shown in Table 6. The results show that after re-matching the sample, the regression coefficient of regulatory penalties (Penalty) is still significantly negative at the level of 1%, indicating that regulatory penalties inhibit the performance of life insurance companies, which is consistent with the above conclusion.

Table 6. The PSM test

	(1)
	ROE
Penalty	-4.509***
	(1.497)
_cons	-124.116***
	(23.672)
CV s	Yes
N	190
r2_a	0.227

4.3.5. Heckman Two-stage Model

Microprudential supervision may have problems of regulatory preference, that is, life insurance companies with better business performance or rapid business scale expansion may be more

strictly monitored by regulatory authorities to prevent their bubble crisis. Therefore, there may be sample self-selection problems between regulatory penalties and business performance of life insurance companies. To alleviate the possible estimation bias caused by this sample self-selection problem, the Heckman two-stage model. In the first stage, the Probit regression model is constructed to calculate the inverse Mills ratio (IMR). In the second stage, the calculated inverse Mills ratio (IMR) was added to the control variable as the model (1) to test the impact of possible sample self-selection problems on the study conclusions.

Table 7. Heckman Two-stage regression

	(1)
	ROE
Penalty	-4.855***
	(1.367)
IMR	-60.257***
	(18.815)
_cons	323.116**
	(153.065)
CVs	Yes
N	530
r2_a	0.275

The test results of the second stage are shown in Table 7. The regression coefficient of the inverse Mills ratio (IMR) is significant, indicating that the sample has self-selection problems, but the regression coefficient of Penalty is still significantly negative at the 1% level, indicating that the regulatory penalty will still have a negative impact on the business performance of life insurance companies after controlling the self-selection problems of life insurance companies. The conclusion of this paper is still true.

4.4. Mechanism Test

Benchmark regression results show that the regulatory penalties and life insurance companies have significant negative correlation between operating performance, in order to further test regulatory penalties on life insurance company operating performance impact mechanism, reference Li Hongkun and Qi Yongzheng (2021) research, this paper selects monetary funds and investment returns as the intermediary variable, and reference Wen Zhonglin (2004), using gradual regression method and build the following model to test the intermediary effect:

$$Med_{i,t} = \alpha_0 + \alpha_1 Penalty_{i,t} + \gamma CVs_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$ROE_{i,t} = \beta_0 + \beta_1 Penalty_{i,t} + \beta_2 Med_{i,t} + \gamma CVs_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where $Med_{i,t}$ represents the intermediary variables, including monetary funds and investment income; $\alpha_1, \beta_1, \beta_2$ are the coefficients to be verified.

4.4.1. Analysis of the Mediation Effect based on Monetary Funds

Regulatory punishment may affect the business performance of life insurance companies by affecting the monetary fund retention scale of life insurance companies. On the one hand, under the regulatory framework of the second generation of compensation, the regulatory authorities shall conduct a comprehensive evaluation of the solvency, operational risk, strategic risk, reputation risk and liquidity risk of life insurance companies and obtain the risk rating, and

comprehensively investigate and evaluate the risk level and management ability of life insurance companies. Risk rating is the classification of regulatory policy implementation and insurance company reputation level of important reference index, in order to achieve better risk rating, life insurance companies will be willing to retain enough available money funds to cope with the occurrence of all kinds of risks, especially in the regulatory pressure strength is higher, life insurance companies tend to expand the proportion of monetary funds in the short term. Monetary funds, on the other hand, as an important part of enterprise assets, is the basis of life insurance company daily operation and development, the life insurance companies need to maintain a certain amount of monetary funds to deal with daily expenses and emergencies, and the expansion of monetary funds retained often means that the life insurance company available funds, so the monetary funds and life insurance companies may have a negative correlation between comprehensive business performance.

Table 8. Mediation effect test based on monetary funds

	(1)	(2)	(3)
	ROE	MC	ROE
Penalty	-5.842***	0.405***	-3.992***
	(1.344)	(0.067)	(1.354)
MC			-4.564***
			(0.852)
_cons	-164.744***	0.546	-162.252***
	(15.048)	(0.753)	(14.672)
CV s	Yes	Yes	Yes
N	530	530	530
r2_a	0.262	0.738	0.299

Based on the above analysis, the monetary capital (MC) of life insurance companies is selected as the intermediary variable, and after the natural logarithmic treatment, model (2) and model (3) are added for testing. The test results are shown in Table 8. Column (2) the results show that the regulatory penalties (Penalty) and monetary funds (MC) between the coefficient at 1% level, the regulatory penalties on the life insurance company operation and management of risk warning effect, when the regulatory penalty frequency is higher, life insurance companies will retain more monetary funds to cope with the occurrence of potential management risk. Column (3), regulatory penalties (Penalty) and life insurance company operating performance (ROE) coefficient is significantly negative, between monetary funds has some intermediary role, namely the micro prudential regulation can in the short term by prompting life insurance companies to expand the size of monetary funds, and reduce the actual available funds of life insurance companies, reduce its business performance.

4.4.2. Analysis of the Mediation Effect based on the Investment Income

Regulatory penalties may also affect the overall operating performance of life insurance companies by affecting the investment income of life insurance companies. On the one hand, the regulatory pressure and life insurance companies a negative correlation between investment income, namely when regulatory pressure and overall management risk control, life insurance companies will tend to money to yield higher investment channels, in order to improve the efficiency of the use of risk insurance, and when regulators solvency management and life insurance companies to make higher requirements, to avoid high intensity of regulatory penalties, life insurance companies tend to hold more low yield high liquidity investment assets. On the other hand, the investment income brought by the use of insurance capital is one of the important sources of operating profit of life insurance companies. Most life insurance

companies need to rely on investment income to make up for the losses generated by underwriting business. Therefore, the investment income will directly affect the business performance of life insurance companies.

In view of this, after the natural logarithmic treatment of the investment income (Inv) of the sample life insurance companies, the model (2) and model (3) are added as the mediation variable, and the results of the test are shown in Table 9. According to the regression of the first (2) results can be found, regulatory penalties (Penalty) on the life insurance company investment income (Inv) has significant negative influence, namely when the life insurance company regulators "named" more, life insurance companies tend to hold more in the short term strong liquidity, low risk of low yield investment assets to control their own business risk. In addition, the results in column (3) show that the regression coefficient of regulatory penalty (Penalty) and the business performance (ROE) of life insurance companies is still significantly negative, indicating that investment income plays a partial intermediary role, that is, regulatory penalty may reduce the investment income of life insurance companies in the short term, and thus reduce their business performance.

Table 9. Test of mediation effect based on investment income

	(1)	(2)	(3)
	ROE	Inv	ROE
Penalty	-5.842***	-0.092***	-5.252***
	(1.344)	(0.030)	(1.344)
Inv			6.430***
			(1.964)
_cons	-164.744***	-5.634***	-128.517***
	(15.048)	(0.332)	(18.569)
CV s	Yes	Yes	Yes
N	530	530	530
r2_a	0.262	0.959	0.275

5. Analysis of Heterogeneity

In order to further investigate the specific applicable boundary of the impact of regulatory penalties on the business performance of life insurance companies, this paper conducts the following heterogeneity analysis based on the characteristic differences of life insurance companies and the external environment.

5.1. Heterogeneity Analysis based on Equity Structure

The impact of regulatory penalties on the business performance of life insurance companies may have different results due to the differences in the ownership structure of life insurance companies. Since 1992, the AIA life insurance in Shanghai, the insurance industry deepening opening to the outside world, so far, in the mainland survival of life insurance companies according to the equity structure characteristics can be roughly divided into Chinese life insurance companies, wholly foreign-owned life insurance companies and sino-foreign joint venture life insurance companies, the latter two can be called foreign life insurance companies. Differences in the ownership structure of life insurance companies may have different impacts on their business performance. one side, Foreign life insurance companies, with their rich insurance business experience, complete internal control mechanism and strong financial support of the parent company, Can both continue to meet the requirements of the regulatory authorities, Can also achieve a stable expansion of the business scale, Therefore, administrative supervision has little impact on its profit realization; On the other hand, Chinese life insurance

companies, due to the short period of establishment, Business operation and management is still in the transition period from exploration to maturity, In the process of the company's operation, disorderly expansion, internal control failure and other problems, This will both cause the high attention of the regulatory authorities, Will also increase the volatility in its operating performance, Therefore, the regulatory penalty has a great impact on the operating profits of Chinese life insurance companies.

In order to verify the above analysis, this paper divides the whole sample into foreign life insurance companies and Chinese life insurance companies according to the shareholding structure of the life insurance companies in the sample, and the regression analysis is carried out respectively. The results are shown in Table 10. The test results show that compared with foreign life insurance companies, the inhibitory effect of regulatory penalty (Penalty) on business performance (ROE) is more significant in Chinese life insurance companies, indicating that the interventional and restrictive effect of regulatory penalty on Chinese life insurance companies is more obvious in the short term.

Table 10. Test of heterogeneity based on equity structure

	(1)	(2)
	foreign capital	Chinese
	ROE	ROE
Penalty	-4.371	-3.403**
	(5.157)	(1.416)
_cons	-202.343***	-224.258***
	(26.864)	(18.738)
CV s	Yes	Yes
N	191	339
r2_a	0.375	0.360

5.2. Heterogeneity Analysis based on Shareholder Background

The restraining effect of regulatory punishment on the business performance of life insurance companies will also be affected by the background difference of shareholders of life insurance companies. As one of the main channels of product marketing in China's life insurance industry, the bank-insurance channel has not only become the main starting point of product marketing of many life insurance companies, but also attracted the admission of some commercial banks or financial groups. In recent years, the banking life insurance companies have emerged with their innate advantages in customer resources, sales channels, credit quality, brand reputation and other aspects, Has achieved good performance and profit performance in the life insurance industry, And because the establishment time of bank life insurance companies is generally short, At present, it is still in the stage of rising scale remuneration, besides, Because the parent company behind the banking life insurance companies spans two important financial sectors, banking and insurance, Therefore, it will be more inclined to comply with regulatory regulations to achieve sound operation, Therefore, the impact of administrative supervision on the operation performance of banking insurance companies may not be significant. However, most of the non-bank life insurance companies are in a state of declining return in scale, and the improvement of operating efficiency is facing bottlenecks. Therefore, under the pressure of operating performance, the probability of violations will be higher than that of bank-bank life insurance companies, so the regulatory pressure has a greater negative impact on the profits of non-bank life insurance companies.

Based on the above analysis, the whole sample is divided into bank life insurance companies and non-bank life insurance companies according to the shareholder background of life

insurance companies, and the regression analysis is carried out respectively. The test results are shown in Table 11. The group regression results show that, compared with the banking life insurance companies, the negative impact of regulatory penalty (Penalty) on business performance (ROE) is more significant among non-bank life insurance companies, which means that the regulatory penalty will bring performance pressure to non-bank life insurance companies in the short term.

Table 11. Test of heterogeneity based on shareholder background

	(1)	(2)
	department of banking	Non-bank department
	ROE	ROE
Penalty	-9.320	-5.741***
	(7.306)	(1.436)
_cons	-111.896***	-175.840***
	(34.698)	(17.265)
CV s	Yes	Yes
N	119	411
r2_a	0.200	0.275

5.3. Analysis of the Heterogeneity based on the Policy Environment

The change of external policy environment is one of the important macro factors to examine the influence of regulatory punishment on the business performance of life insurance companies. Since the first quarter of 2016, China compensation second generation regulatory system, and the scale orientation of compensation generation, risk orientation of the second generation through quantitative regulatory requirements, qualitative regulatory requirements and market constraint mechanism three pillars, guide the insurance companies pay attention to the solvency management, improve their market competitiveness. In the second generation of implementation, our life insurance company investment management technology improve, capital and risk gradually return to normal positive correlation, so compared to the generation period, under the second generation period of life insurance company will have better conform to the regulatory ability and steady management ability, more detailed microprudential regulation will play more the role of specification and guidance, the management performance of life insurance company.

In view of this, this paper assigns the sample value of life insurance companies before the implementation of the second generation to 0, and the sample value of life insurance companies after the implementation of the second generation of compensation to 1, and then conducts group regression according to the assigned value. The regression results are shown in Table 12.result display, Before the implementation of the second generation, The regression coefficient between the number of regulatory penalties (Penalty) and the business performance (ROE) of life insurance companies is-6.784, Significant at the 1% level, After the implementation of the second generation of compensation, The negative impact of regulatory penalties (Penalty) on the operating performance (ROE) of life insurance companies was mitigated, And the regression coefficient is not significant, After the implementation of the second generation, Life insurers to respond to stricter regulations, Most people pursue more robust development strategies, And put forward higher requirements for their own internal control quality, And reduce its exposure to regulatory penalties, Microprudential regulation is gradually returning to the original role of the industry red line, The impact on the operating performance of life insurance companies is no longer significant.

Table 12. Test of heterogeneity based on the policy environment

	(1)	(2)
	Before the implementation of the second generation	After the implementation of the second generation
	ROE	ROE
Penalty	-6.784***	-2.556
	(2.074)	(2.409)
_cons	-213.340***	-97.033***
	(26.490)	(18.817)
CV s	Yes	Yes
N	255	275
r2_a	0.276	0.163

6. Research Conclusions and Policy Recommendations

This paper is based on the micro data of 48 life insurance companies in China's life insurance industry from 2010 to 2021, Empirically tested the impact of regulatory penalties on the business performance of life insurance companies, The study found that: the short-term regulatory punishment has a restraining effect on the business performance of life insurance companies, It will take time for the positive effects of microprudential regulation to play, This conclusion is still true after the robustness test and endogenous treatment; The results of mechanistic analysis showed that, Regulatory penalties can be imposed by increasing the size of monetary funds and reducing their investment returns, Thus has a negative impact on the overall business performance of life insurance companies; The results of the heterogeneity analysis showed that, The regulatory penalty has a more negative impact on the business performance of life insurance companies of Chinese holding, non-banks and the second generation.

Based on the above research conclusions, in view of the problem of how to better play the normative and guiding role of insurance supervision and promote the long-term stable operation of life insurance companies, this paper puts forward the following policy suggestions: On the one hand, insurance regulatory agencies should constantly improve the regulatory system, strengthen the system construction, explore and implement the differentiated regulatory mode of the insurance industry on the basis of existing classified supervision, so as to improve the pertinancy and effectiveness of insurance supervision and give full play to the normative and guiding role of insurance supervision. On the other hand, insurance regulatory agencies still need to innovate regulatory means, and use big data, blockchain, artificial intelligence and other emerging technologies to enable the innovation of regulatory methods, so as to improve the efficiency and level of insurance regulation and promote the healthy development of the insurance industry.

6.1. Regulatory Level

On the one hand, life insurance companies should strengthen the ability of comprehensive risk management and adapt to the regulatory requirements, improve the information disclosure mechanism, improve the transparency, so that investors, consumers and regulatory agencies can better understand the company's business situation and risk situation. Life insurance companies, on the other hand, more need to strengthen their core competitiveness, in terms of insurance business, life insurance companies can explore new technologies, new channels and new forms, improve differentiated competitive advantage, in terms of investment business, life insurance companies need to according to the market environment real-time optimization of

strategic asset allocation and tactical asset adjustment, in order to achieve considerable return on investment.

References

- [1] Chen Juanjuan, Hou Juan. Comparcomparative study on the effect of homogenized and differentiated supervision of commercial banks -- is based on the "invalid interval index" [J]. Shanghai Finance, 2015 (6): 77-81.
- [2] Chen Xiujian, Jiang Lin, Lv Qing. The impact of the implementation of "compensation second generation" on the operation and management of life insurance companies [J]. Shanghai Insurance, 2018 (2): 55-59.
- [3] Chu Jian, Fang Junxiong. Is "punishing one" necessarily "making an example of others"?-- Study on indirect deterrence failure of regulatory punishment [J]. Accounting Research, 2021 (1): 44-54.
- [4] Du Yuchao. Research on business performance of banking and life insurance companies in China [J]. Journal of the Vocational College of Insurance, 2020,34 (1): 37-44.
- [5] Gu Xiaolong, Xin Yu, Teng Fei. Does illegal regulation have governance effect -- On the dual nature of stock price synchronization index [J]. Nankai Management Review, 2016,19 (5): 41-54.
- [6] Guo Jinlong, Li Bing. Development status and problems of banking and life insurance companies in China [J]. The Banker, 2019 (10): 100-102.
- [7] Guo Feng, Lu Xiaoliang, Lin Zhiyuan, etc. A disaster in the pond: social media connection and stock price spillover effect of listed companies -- Based on regulatory punishment in China [J]. Journal of Management Science, 2023,26 (4): 111-131.
- [8] Guo Ruixin, Zhou Juan, Wang Ying. Litigation and administrative penalties for insurance contracts: Based on big Data research [J]. Insurance Research, 2022 (2): 64-78.
- [9] Hu Yaqian, Li Hong. The influence of equity structure and characteristics of board of directors of banking insurance companies on business performance -- empirical research based on EVA [J]. Shanghai Insurance, 2015, (12): 17-24.
- [10] Jiang Caifang, Chen Shou. Effectiveness Analysis of DEA on Operation Performance of Life Insurance Companies in China [J]. Financial Theory and Practice, 2014,35 (4): 27-32.
- [11] Jiang Liqin, Zhang Yixin. The role of the risk rating system of insurance companies in the regulation [J]. Shanghai Insurance, 2004 (7): 7-8.
- [12] Jin Xiyue. Study on the relationship between the characteristics of the board of directors and the ownership structure and the business performance of banking insurance companies in China [J]. Journal of The Vocational College of Insurance, 2019,33 (1): 27-31.
- [13] Li Hongkun, Qi Yongzheng. How does the "compensation second generation" affect the investment income of insurance companies?-- Based on the panel data study of 85 insurance companies [J]. Investment Research, 2021,40 (8): 110-129.
- [14] Li Qian, He Guangwen, Chen Xiaojie. The impact of quantitative positioning regulation on the social performance and financial performance of rural banks -- Evidence comes from 900 rural banks in China [J]. Journal of Hunan Agricultural University (Social Science Edition), 2023,24 (6): 1-12.
- [15] Liu Lu, Wang Xiaohan, Wei Longfei. The influence of the equity structure of life insurance companies on business performance -- Based on the perspective of manager agency cost [J]. Financial Theory and Practice, 2023,44 (5): 19-25.
- [16] Lu Yuxuan, Zhao Guiqin. Do regulatory penalties curb risk-taking by insurers?-- Empirical test from Chinas life insurance industry [J]. Modern Finance and Economics (Journal of Tianjin University of Finance and Economics), 2023,43 (7): 106-125.
- [17] Luo Yan, Zhao Han. Research on Differentiated Regulation of Insurance Industry in China [J]. Southwestern Finance, 2023, (2): 17-30.
- [18] Minglei, Huang Yuanbiao, Yang Shenggang. Research on the penalty effect of banking regulation [J]. Economic Research, 2023,58 (4): 114-132.

- [19] Minglei, Yang Shenggang, Deng Shijie. Regulatory penalties, regulatory tolerance, and deposit insurance prices [J]. *Journal of Management Science*, 2019,22 (8): 59-70.
- [20] Pan Min, Wei Hairui. Does increased regulation have a risk suppression effect?-- Empirical evidence from the Chinese banking industry [J]. *Financial Research*, 2015, (12): 64-80.
- [21] Song Yunling, Li Zhiwen, Ji Xinwei. See the punishment effect of Chinas securities regulation from the performance forecast violations [J]. *Financial Research*, 2011 (6): 136-149.
- [22] Sun Wujun, Li Zheng. Empirical research on the relationship between risk and capital of life insurance companies under the "second generation of compensation" -- is based on the perspective of comparative research with the first generation of compensation [J]. *Journal of Beijing Technology and Business University (Social Science Edition)*, 2020,35 (2): 105-115.
- [23] Wang Jianbing, Chen Zhengguang, Lin Chun, etc. Practice and exploration of comprehensive risk rating work of insurance companies [J]. *Shanghai Insurance*, 2020 (8): 42-45.
- [24] Wang Jinyang, Zhang Xiaodong. The impact and potential opportunities of differentiated regulation in the insurance industry [J]. *Financial Expo*, 2023, (12): 11-12.
- [25] Wang Mingli, Lu Feng, Gao Shuang. The impact of internal governance of insurance companies on business performance -- Based on the empirical data of Chinese insurance companies [J]. *Business Economics Research*, 2022 (2): 150-153.
- [26] Wang Wei, Wang Zhidan. Characteristics, trends and effectiveness of bank regulatory penalties -- Analysis based on 25,040 penalty information disclosure forms [J]. *Southwest Finance*, 2023 (2): 3-16.
- [27] Wang Yuanyuan. Empirical analysis of the impact of commercial banks on the business performance of insurance companies [J]. *Journal of Guangdong Business School*, 2013,28 (4): 23-29 + 81.
- [28] Wen Zhonglin. Zhang Lei, Hou Jietai, etc. Mediation effect testing procedure and its application [J]. *Psychological Journal*, 2004 (5): 614-620.
- [29] Xiao Yugu, Zhang Junyan, Yu Jiao. Analysis and efficiency evaluation of insurance regulations in China [J]. *Insurance Research*, 2019 (3): 17-26.
- [30] Xiong Wanting. International experience and implications for macro-prudential and micro-prudential coordination [J]. *International Economic Review*, 2021, (5): 34-52 + 5.
- [31] Xu Hao. The impact of the second generation on the solvency of insurance companies [J]. *Investment and Entrepreneurship*, 2022,33 (11): 157-159.
- [32] Xue Xixiang. Research on the optimization of the financial management system of banking life insurance companies based on risk control [J]. *Chinas Collective Economy*, 2022 (18): 158-160.
- [33] Yang Weiping, Zhou Mi, Cheng Meng. Research on Operation Performance Evaluation of Chinese Life Insurance Companies under the background of Internet finance [J]. *Financial Theory and Practice*, 2016,37 (4): 31-36.
- [34] Yang Xia, Wang Zhiyuan, Wang Lishi. Comparative study on operating efficiency of banking and non-bank life insurance companies [J]. *Financial Theory and Practice*, 2016 (3): 96-102.
- [35] Yao Jiabin, Shen Jian, Zhu Luyi, et al. Empirical Study on the Business Performance of Life insurance companies in China [J]. *Journal of Shanghai Lixin Institute of Accounting and Finance*, 2017 (3): 101-110.
- [36] Yu Yingze, Xia Long, Duan Shenglan. Market supervision and enterprise growth -- Empirical analysis based on administrative punishment data [J]. *Industrial Economy of China*, 2023 (8): 118-136.
- [37] Zhang Ji, Sun Jian. The impact of "compensation second generation" on the use efficiency of insurance funds of life insurance companies [J]. *Tax and Economy*, 2019 (5): 15-22.
- [38] Zhang Jiatong. Analysis on the Impact of Capital Structure on Company Performance of Listed Insurance Companies in China [J]. *Gansu Finance*, 2021, (12): 54-59 + 63.
- [39] Zheng Lijia. Analysis of business performance and influencing factors of insurance companies [J]. *Business*, 2020 (10): 124 + 126.
- [40] Zhongend, Zhao Guiqin. The formation, evaluation of reputational risks and their economic impact in Chinas insurance industry [J]. *Insurance Research*, 2020 (11): 3-18.

- [41] Zhu Song, Huang Haijiao, Xu Jing. Rating charging, rating regulation and credit rating rationality -- evidence based on experimental research [J]. Financial Market Research, 2023 (12): 81-94.