Actuarial Evaluation and Investment Strategy Selection in the Application of Insurance Funds

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Abstract: With the continuous development of the insurance industry, insurance companies are becoming increasingly important in terms of risk protection and asset management. In this process, how to achieve efficient use of insurance funds, ensuring both risk coverage and asset appreciation, has become the main issue for company operations. Actuarial evaluation, as a fundamental tool for insurance fund management, can help enterprises accurately calculate insurance liability reserves and future cash flows, providing scientific basis for fund allocation. Meanwhile, the choice of investment strategy determines the liquidity, profitability, and risk level of insurance funds, which affects the long-term financial stability of the enterprise. In the current market environment, the decline in interest rates, increased asset volatility, and tightening regulatory policies have significantly increased the complexity of the use of insurance funds. Therefore, the organic combination of actuarial evaluation and investment strategy can help improve the efficiency of fund management and assist insurance companies in developing steadily in a complex and ever-changing financial environment. Based on this, the article conducted relevant research on actuarial evaluation and investment strategy selection in the use of insurance funds.

Keywords: Insurance Fund Utilization; Actuarial Evaluation; Investment Strategy

1. Introduction

This study aims to systematically explore the synergistic relationship between actuarial evaluation and investment strategies in the use of insurance funds, analyze the advantages and disadvantages of different investment strategies in practical operations, and provide scientific fund allocation plans for insurance companies. In terms of research methods, a combination of literature review, case analysis, and data modeling is adopted to deeply analyze the current situation of the foreign insurance market. At the same time, combined with the dynamic asset liability management (ALM) model, explore the applicability of actuarial techniques in different market environments, and analyze investment strategy choices for assets such as bonds, stocks, and innovative financial instruments.

2. Current Status of Insurance Fund Utilization

2.1 The Impact of Interest Rate Decline and Asset Yield Decline

The current global economic environment is plagued by low or even negative interest rates, resulting in a significant decline in the returns of traditional fixed income assets that insurance companies rely on, such as bonds and bank deposits. The long-term nature of insurance business requires a stable use of funds, therefore bond assets account for a large proportion in investment portfolios. However, the decline in interest rates directly weakens the return on assets and increases the difficulty for insurance companies to achieve their established revenue targets. At the same time, insurance companies need to match liabilities to protect customer interests, and the low yield environment increases the cost of debt coverage. In order to improve overall returns, insurance companies have to invest some of their funds in high-risk assets, which puts higher demands on their risk control capabilities.

2.2 Threats of Financial Market Fluctuations to Fund Stability

In recent years, there has been a significant increase in uncertainty factors in the global financial market, such as geopolitical risks, pandemic impacts, and fluctuations in macroeconomic cycles. The frequent fluctuations in market prices of stocks, bonds, and other financial assets have had a significant impact on the investment portfolios of insurance companies. Due to the long investment cycle of insurance funds, short-term market fluctuations may affect the balance of long-term asset liability matching. Especially during significant fluctuations in the capital market, insurance companies may need to passively reduce their holdings of assets and even face liquidity risks. The increasing interdependence between different asset classes also affects the risk diversification effect of investment portfolios, thereby increasing the difficulty of risk control.

2.3 Restrictions and Compliance Requirements of Regulatory Policies

In order to prevent systemic risks, regulatory agencies in various countries have set strict regulations and restrictions on the use of insurance funds, such as capital adequacy requirements, asset liability matching management, and investment ratio restrictions for specific asset classes. For example, some countries have set limits on the investment of insurance funds in equity assets, making it difficult for companies to expand their stock investment scale and obtain more returns when market conditions are good. The promotion of green finance and sustainable development concepts also requires insurance companies to pay more attention to environmental, social, and governance (ESG) factors in investment decisions, further increasing the complexity of fund utilization. In the increasingly complex regulatory environment, insurance companies need to optimize their investment strategies and strengthen compliance management to reduce the cumulative effects of market risks.

3. The Application of Actuarial Evaluation in Insurance Fund Management

3.1 Basic Principles of Actuarial Evaluation

Actuarial evaluation is an important tool for insurance companies to manage funds and control risks, with the aim of predicting potential risk costs through scientific mathematical models and statistical methods. Insurance companies need to calculate liability reserves based on actuarial principles to ensure they can meet claims demands. The calculation process of liability reserve needs to consider the type and duration of the policy, covering various variables such as mortality rate, interest rate changes, and inflation. Actuarial evaluation is based on the principle of Asset Liability Matching (ALM), which synchronously manages the assets and liabilities of insurance companies to maintain financial security.

3.2 The Role of Actuarial Evaluation in Fund Allocation

Through actuarial models, insurance companies can make reasonable predictions about liabilities and provide guidance for asset allocation. The Asset Liability Matching (ALM) management model ensures that investment returns match the demand for debt repayment in terms of time and amount, reducing risks caused by market fluctuations or insufficient liquidity. Actuarial evaluation helps establish dynamic investment portfolio strategies. According to the results of actuarial analysis, insurance companies can adjust their asset allocation in a timely manner when the market environment changes, achieving maximum returns and minimum risks. Meanwhile, actuarial models can be used to evaluate the risk level of different investment strategies, ensuring the achievement of long-term robust return goals while meeting the company's risk appetite.

3.3 Application of Dynamic Actuarial Evaluation

In the current complex and ever-changing market environment, dynamic actuarial evaluation has gradually become an important trend in insurance fund management. Dynamic actuarial evaluation is a real-time adjustment model based on market changes, which continuously updates important parameters to make the evaluation results more in line with the actual situation. For example, when there is a change in interest rates, the dynamic evaluation model will promptly reflect the change and adjust the asset allocation plan accordingly. In addition, insurance companies can use stress testing and scenario analysis methods to predict the risks that may arise in different market scenarios. Through multidimensional dynamic analysis, insurance companies can improve their ability to respond to market fluctuations, better grasp investment opportunities, and achieve the preservation and appreciation of funds. With the development of artificial intelligence technology, dynamic actuarial evaluation is gradually introducing more advanced algorithms and data analysis methods, making insurance companies' risk management and investment decisions more intelligent.

4. Investment Strategy Selection of Insurance Funds

4.1 Stable Investment Strategy

A prudent investment strategy is an important strategy commonly used by insurance companies in the use of funds, aimed at minimizing risks and ensuring long-term stable returns on funds. In a stable investment portfolio, bond assets, government bonds, and high rated corporate bonds are the main allocation targets. This type of asset has the characteristics of stable returns and low default risk, which can provide stable cash flow for insurance companies and ensure sufficient payment ability in case of customer claims. At the same time, the low volatility of such assets helps to cope with the uncertainty of the financial market and reduce asset losses caused by severe market price fluctuations. At the same time, a prudent strategy emphasizes liquidity management by allocating some short-term assets and cash reserves to ensure that the enterprise can quickly liquidate in emergency situations to meet sudden funding needs. In the current low interest rate environment, the decline in traditional bond yields has become a major challenge for insurance companies. Therefore, the implementation of a prudent investment strategy requires controlling risks while maximizing the level of returns. Some insurance companies are exploring various ways to optimize bond investments, such as focusing on long-term bonds and corporate credit bonds, in order to obtain higher coupon yields. With the rise of green finance, some companies have gradually increased their investment in green bonds, fulfilling their social responsibilities while achieving stable returns. A prudent strategy is not limited to bond investment, but will moderately allocate a certain proportion of low volatility assets, such as real estate and infrastructure projects. This type of asset typically has a longer investment cycle, but its rental income and project returns are relatively stable, which helps balance the liquidity and profitability of funds. In order to further strengthen risk management, insurance companies will use Asset Liability Matching (ALM) tools to scientifically manage the structure and maturity of assets and liabilities, ensuring that they match each other in the time dimension. At the same time, stress testing and scenario analysis have become important means of risk control, helping companies develop response plans in advance by simulating possible situations in different market environments.

4.2 Growth Oriented Investment Strategy

The growth oriented investment strategy aims to enhance the long-term returns of insurance funds by allocating high return equity assets and other high-yield investments. Growth oriented investment emphasizes the pursuit of capital appreciation while controlling risks, and is suitable for investment portfolios that pursue maximum returns. Stocks, private equity, real estate investment trusts (REITs), and other assets are important components of a growth strategy. The high growth potential of these assets can bring significant returns during the upward cycle of the market, while dividends and capital appreciation also provide additional cash flow support for insurance companies. In order to cope with market uncertainty, insurance companies usually lock in the growth potential of high-quality assets through long-term investments, thereby smoothing out the impact of short-term fluctuations. In addition, insurance companies will also develop phased investment plans based on their own debt structure and funding needs when allocating equity assets, ensuring that they pursue high returns without affecting liquidity and solvency. In recent years, with the diversified development of financial markets and the emergence of innovative tools, insurance companies have begun to explore investing some of their funds in emerging markets and innovative assets, such as technology company equity and environmental, social, and governance (ESG) related investments. Insurance companies usually use intelligent algorithms to monitor market trends and investment targets in real time, ensuring that they can respond quickly when there are significant changes in the market. In addition, in order to diversify risks, the company will distribute funds across assets in different industries and regions, and adopt hedging tools to reduce losses caused by fluctuations. In a growth strategy, maintaining flexibility in asset allocation is particularly important. Insurance companies need to adjust the ratio of equity and fixed income assets in a timely manner based on macroeconomic conditions and market trends to achieve a dynamic balance between risk and return.

4.3 Diversified Investment Strategy

A diversified investment strategy involves diversifying funds across multiple asset classes, markets, and regions to reduce systemic risks caused by fluctuations in a single market or asset. The investment portfolio of Ping An Insurance in China is a typical example of diversification strategy, covering various asset classes such as bonds, stocks, real estate, private equity, and infrastructure investments. As shown in Table 1. Through extensive allocation, Ping An has achieved stable growth in long-term returns while ensuring financial stability. Bond investment is an important component of its portfolio, used to provide stable cash flow support, especially during periods of high market uncertainty. At the same time, Ping An actively participates in investments in the stock and private equity markets to seize opportunities for economic development and enhance the potential for asset appreciation.

Table 1. Investment Portfolio of Ping An Insurance Funds in China

Unit: Billion	2017	2018	2019	2020
Debt related assets	**16,285**	**19,476**	**24,484**	**26,738**
Bond	10,717	12,708	15,041	18,775
Debt based fund	120	435	422	498.06
Preferred shares	785	799	1,149	1,187.51
Perpetual stock	0	0	178	537.33
policy holder pledge loans	832	1,112	1,393	1,613.81
Debt plan investment	1,403	1,565	1,325	1,610.47
Investment in financial products	2,428	2,857	2,976	2,516.38
Equity financial assets	**3,843**	**3,581**	**4,506**	**5,038**
Stock	2,725	2,318	2,954	3,151
Equity Fund	332	443	495	670
Investment in financial products	398	322	382	392.98
Non listed equity	388	498	675	824
long-term equity investment	**584**	**932**	**1,203**	**1,560**
Investment real estate	**478**	**534**	**610**	**632**
Cash	**1,392**	**1,165**	957	872.01
Other investments	283	247	219	295.67
Time deposit	1,631	2,013	2,109	2,254

In terms of global layout, Ping An diversifies regional risks through overseas investment, with some funds invested in developed markets and emerging economies to achieve diversified sources of income. With its rise, Ping An has also incorporated ESG (environmental, social, and governance) factors into its investment decisions, increasing the proportion of investments in green bonds and clean energy projects to achieve a dual result of social benefits and economic returns.

5. Conclusion

With the complexity of the economic environment, in the context of low interest rates, increased market volatility, and increasingly strict regulatory policies, insurance companies need to ensure the safety and liquidity of their funds and achieve long-term asset appreciation through diversified investment strategies. At the same time, the rise of emerging concepts such as green finance and ESG investment has brought more innovative opportunities for insurance funds, driving their development towards a more sustainable direction. Therefore, insurance companies must continuously optimize their investment portfolios, seek certainty in uncertainty, and achieve efficient use of funds.

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